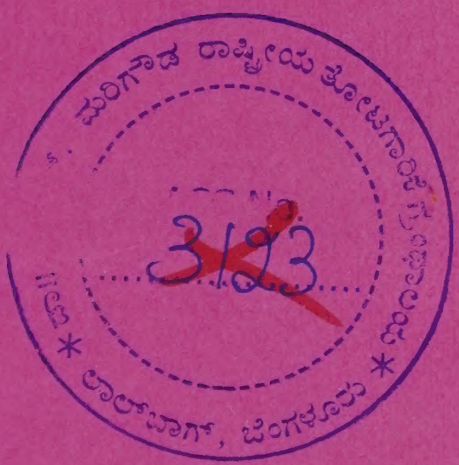
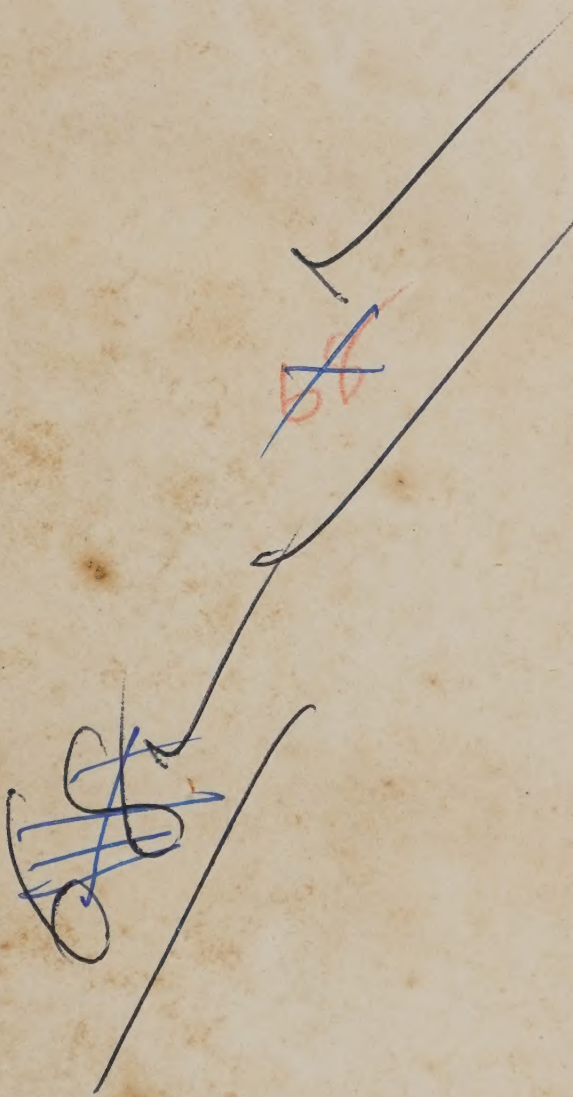
Dr.M.H.M.G.N.H. Library
581. KUR
3268
3268
581 KUR

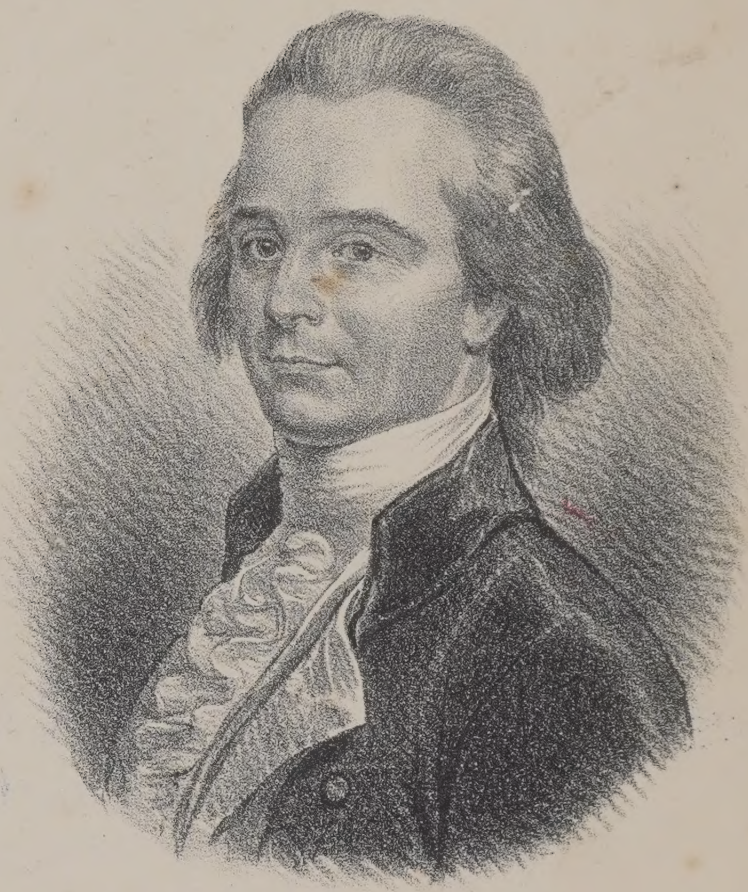
ಗ್ರಂಥಾಲಯ
ಲಾಲ್‌ಭಾಗ್, ಬೆಂಗಳೂರು



No. 95

JB16.458
M77





Dr. W. ROXBURGH

THE FATHER OF INDIAN BOTANY.

Dr.M.H.M.G.N.H. Library
581. KUR
3268

FOREST FLORA

OF

BRITISH BURMA.

68

BY

S. KURZ,

CURATOR OF THE HERBARIUM, ROYAL BOTANICAL GARDENS, CALCUTTA.

Government of Karnataka
Dr. M. H. Marigowda National Horticulture Library
Directorate Of Horticulture Lalbagh,
Bangalore - 560 004

ACC. No. 3268

CALL No. 581 KUR

Published by order of the Government of India.

CALCUTTA:
OFFICE OF THE SUPERINTENDENT OF GOVERNMENT PRINTING.
1877.

581
KUR
Acc No-3268

CALCUTTA:

PRINTED BY THE SUPERINTENDENT OF GOVERNMENT PRINTING,
8, HASTINGS STREET.

GOVT BOTANIC GARDENS
LAL BAGH BANGALORE.
LIBRARY
No. 578 Date 10-10-2011

CONTENTS.

Vol. I.

	Page.
Preface	v
Abbreviations	xi
Introductory	xiii
Evergreen forests	xvi
Littoral forests	xvi
Swamp forests	xvii
Tropical forests	xvii
Hill forests	xx
Deciduous or leaf-shedding forests	xxii
Open forests	xxii
Dry forests	xxiv
Mixed forests	xxv
Dune forests	xxviii
Bamboo jungles and savannahs	xxix
Deserted toungyas or poonzohs	xxix
Forest Flora	1
Synopsis of natural orders	1—14
Species (of all polypetalous orders)	15—546
Additions and Corrections	547—549

Vol. II.

Forest Flora, continuation of species (of the gamopetalous, apetalous, monocotyledoneous and cryptogamic orders)	1—574
Additions and Corrections	575—5
Index to the Vernacular and English Names	557
Index to the Orders, Genera, and Species	58

PREFACE.

THE chief object of the present work has been to arrange and describe the woody plants of British Burma, and in so doing to furnish a means by which the forester in Pegu might be enabled to name his trees and shrubs, and thus be placed in a position to work up the more practical questions and bearings which naturally can only be supplied by those employed in the Forest Department itself.

Those acquainted with the primitive state of Burma will never expect an exhaustive treatise on the woody vegetation of that country. Indeed, I can offer but a very incomplete account of its Forest Flora. The number of woody plants here described amounts only to about 2,000 species, while the herbaceous vegetation exceeds 2,500, or four woody plants to five herbs—a rather anomalous proportion as compared with other tropical countries similarly circumstanced, which show a decided preponderance of woody over herbaceous plants, *viz.*, one and a half to three of the former to one of the latter. This forcibly demonstrates how many woody plants must still remain to be detected.

I have followed the arrangement and style of description adopted by Bentham in his Colonial Floras of Hong-Kong and Australia. I believe that his mode of treatment of the subject is the one best adapted for use in this country, not only for the public in general but equally so for the practical man. Those not versed in systematical work will always experience more or less difficulty in naming a plant from a book alone; for it is patient study and practice which alone can instil that tact in discriminating between essential and accidental characters which is indispensable in all systematic work. The analytical keys of the genera as well as of the species have therefore been worked out more carefully. These are more likely to exhibit the differences to the uninitiated than descriptions, which serve more for final verification and identification.

Owing to the great number of species which had to be described, the work has run to two volumes, instead of one volume only as originally intended. To have disposed of the shrubs and trees of minor importance by using some more or less happy descriptive phrase for, or by simply alluding to, them, appeared to me likely to do more harm than good.

The synonymy and citations in this work are restricted to Indian Forest Literature (*viz.*, Beddome's *Flora Sylvatica of Madras*, and Brandis' and Stewart's *Forest Flora of North-West and Central India*), and to the *Flora of British India* edited by Sir J. D. Hooker (of which work only four parts have as yet been issued). Those interested in synonymy, or those who wish for more scientific data regarding the Burmese Flora, may

consult my *Contributions towards a knowledge of the Burmese Flora*, in the course of publication by the Asiatic Society of Bengal.[1]

As to the vexed question of nomenclature, I confess myself an admirer of, and adherent to, the Botanical Laws as laid down by the International Botanical Congress at Paris in the year 1867, and published by Professor Alph. de Candolle. These are translated into nearly all modern languages, and are now generally adopted in Europe, except at Kew. However, I have deviated in several cases in favour of Hooker's *Indian Flora*, or kept up old established names, not because I assent to such irregularities, but simply because I thought it not fair that I, a German, should introduce my individual convictions into a practical work written solely for the use of English people. In my Contributions above referred to, I have endeavoured to follow strictly the path of law and logic.

The botanical terms used are those generally in vogue, but I have preferred (so far as my limited acquaintance with the English language has allowed me to do so) to use English terms in preference to anglicised Latin ones. A new term (*cut*) is introduced here and requires explanation. It is well known that Indians continually use their wood-cutting knives (*dah*, *parang*, or whatever name the various peoples give to them) for cutting into the bark and sap-wood of trees. By so doing they recognise the species in the depths of the forests, by a combined observation of the nature and colour of the bark or the wood and of the juice or milk that exudes

[1] Four parts have passed through the press, and three or four more parts will conclude the work so far as the phanerogams are concerned.

from it, etc. At the same time, they are usually also aided by the general appearance of the crown, the complexness or simpleness of the leaves, and the colour of the leaf-buds.

I had to reduce, also, the remarks on the uses, etc., to a minimum, by usually recording only uses of primary and recognised importance, omitting, as a rule, all such petty qualities as natives alone take advantage of in their medicines, food, etc. Dr. Brandis' *Forest Flora* will furnish in this respect a great amount of information, more especially as he has taken up also most of the more important Burmese trees. The Rev. Dr. F. Mason's book entitled *Burmah, its people and natural productions* (Rangoon 1860), is in the hands of most residents in Burma, and I understand that another edition of it will be issued. It also contains a large amount of useful practical information.

As to the vernacular names, I have already given my opinion in Appendix A of my preliminary report; and I have here only to remark that I have taken up in this work only such Burmese names as appeared to me tolerably trustworthy.

The area of Burma adopted for the present Forest Flora extends from Chittagong, Prome, and Martaban down to Tenasserim (Pakchan river) and the Andamans. The woody plants of the adjoining provinces of Siam and of Independent Burma have also been included for the reason that most of them will be found within the British frontier.

A brief introductory, and explanations of the abbreviations adopted in the Flora, will serve for the proper

understanding of the physical and geographical relations recorded under each species.

In conclusion, I have to express my sincere thanks to all who have in any way supported me in my work; and I beg also to offer my cordial thanks to the Government of India for the uniform courtesy and forbearance I have experienced at their hands while engaged upon this work.

ABBREVIATIONS.

1. Abbreviations relating to size, etc., of a tree.

The height, length of clear stem, and girth are included between parentheses, thus :—

(100—120+80—90+10—12) = 100—120 ft. high, the clear stem 80 – 90 ft. long, and girth 10—12 ft.

2. Abbreviations relating to soil and substratum.

SS. = Substratum or soil.
Sal. = Saline.
All. = Alluvium.
Dil. = Diluvial, or older alluvium generally.
Lat. = Laterite.
Lat. p. = permeable laterite.
Aren. = Arenaceous, including sands and all the pebbly and gravelly soils. All sands along the coasts (beach forests) in this work are *calcareous;* those inland are supposed to be *silicious.*
Arg. = Stiff impermeable clays, etc.
SiS. = permeable silicious sandstone.
CaS. = Calcareous sandstone.
Ca. = Limestone.
Metam. = includes all other rocks, whether plutonic or metamorphic.

3. Abbreviations relating to light.

s. = shade-loving.
l. = light-loving.
s × l. = indifferent.
s+l. = shade in R.S., light in H.S.
s : l. = shade in youth, light when full-grown.

4. Abbreviations relating to seasons and to the flowering, etc.

Fl. = Flowering time.
Fr. = Fruiting time.
C.S. = Cold season.
H.S. = Hot season.
D.S. = Dry season.
R.S. = Rainy season.

N. B.—The weight of a cubic foot (marked □′) of seasoned wood is given in English pounds, and so is the breaking weight (break. w. or weight).

INTRODUCTORY.

I HAVE given a general sketch of the vegetation of Pegu in my "Preliminary Report on the Forest and other Vegetation of Pegu" published[1] by the Government of India in 1876, and I now proceed to give a summary of the forests in their relation to soil and climate as far as connected with practical forestry.

Burma, as a whole, forms the north-west corner of the Indo-Chinese or Further Indian region. Although extending from Lat. 11° to 25°, still by far the greatest portion of it is situated within the influence of the monsoons, and hence the seasons are divided into a rainy and dry season. The former commences about the end of May and breaks up about November, with a temperature ranging from 70-75° in the morning to 90-95° in the afternoon. The rain-fall varies greatly according to the provinces, as may be seen from the subjoined table :—

Stations.	Rain-fall in inches in				Average of four years.
	1868.	1869.	1870.	1871.	
Akyab	208·70	187·16	176·10	199·80	192·94
Kyouk-phyoo . . ,	153·90	166·11	157·50	193·10	167 65
Sandoway	253·15	191·50	217·93	229·90	223·12
Bassein	138·56	89·14	87·54	93·40	102·16
Rangoon	...	...	144·60	143·40	144·00
Swayghyeen	187·50	183·10	183·80	201·90	189·07
Myanoung	52·40	35·78	74·13	73·80	59·20
Thayet-myo	50·15	33·20	41·13	54·60	49·77
Prome	48·50	34·00	46·21	62·90	47·90
Tounghoo	...	46·90	64·53	103·30	70·91
Moulmein	211·20	189·85	185·45	245·70	208·05
Tavoy	193·70	190·55	185·60	229·90	199·30
Mergui	178·40	165·00	147·70	164·40	163·87

In the central parts of Ava the climate becomes drier, and rain is said to cease altogether about Paghan.

[1] Office of the Superintendent of Government Printing, No. 8, Hastings Street, Calcutta. Price Rs. 10.

The dry season divides into a cold one from November to February, with a temperature of 57-60° in the morning to 85-88° in the afternoon, with a minimum of 52-54°; and a hot one commencing towards the end of February and continuing to the middle or end of May, showing a temperature of 70-74° in the morning to 95-100° in the afternoon. The maxima observed range from 104-106°, while the minima go down as far as 69° Fahrenheit. Rain is scanty during the whole dry season, being restricted to one or a few showers, which usually occur in March, but heavy dew in the cold and haze in the hot season act beneficially upon vegetation generally.

The greater part of the country is hilly or mountainous, and thus favourable to the existence of forests, which therefore cover the whole of the terrain except where the axe of the native has destroyed them. In those extensive alluvial plains which are formed by the Irrawaddi, Sittang, and partially by the Salween and other rivers, the forests gradually give way to extensive savannahs which spread out along the rivers themselves.

The greater the difference of the seasons, the greater is also the influence of exposure; and thus we see in Burma the deep valleys and the shady slopes of the hills more or less covered with evergreen tropical forests, while the more sunny slopes and plains are studded with leaf-shedding forests. An exception form here the forests growing in swampy depressions and the mangrove forests which occupy the sea coasts.

The area of tropical evergreen forests (which form the bulk of vegetation between the tropics towards the equator) is greatest in the southern provinces, as in Tenasserim and the Andamans, but it becomes more and more restricted and circumscribed as we proceed northwards, where these forests retreat to the valleys and favourably exposed slopes of the hills, owing to the dryness and heat during the hot season. On the other hand, the leaf-shedding forests become of less extent and are more circumscribed southwards, until they disappear altogether or become restricted to certain substrata, or still more frequently the leaf-shedding trees mix with the evergreens and form no more conspicuous forests for themselves.

Socialism of trees of the same species is a characteristic of the temperate zones and recurs partially in the higher regions of our Indian mountains, as is shown by the pine forests; but in the tropical zone this socialism of conspecific trees is greatly reduced. There prevails a continuous struggle for supremacy between such a large number of different trees that one often becomes quite bewildered. An evergreen tropical forest consisting of 200 to 300 species of trees alone to the square mile is almost the rule, and leaf-shedding forests (excepting the very poorest of them) are still composed of a greater number of trees than any

forest in temperate Europe possesses. Indeed, were it not for the influence of such factors as moisture, light, and soil, the forest-masses of India would present an inextricable chaos. Climate and soil generally dictate the presence or absence of forests, while light, sloping, and the physical conditions regulate it; but it is moisture and certain substrata that bring about the most striking changes within a climatologically identical area, more or less successfully expelling certain soil-steady trees, while allowing others more adapted, to grow up more vigorously in their competition with not a small number of soil-vague trees. Thus have formed the mangrove, eng, dry, and other forests which exhibit such a characteristic aspect that they are generally recognised and known not only by the practical man but also by the native.

The soft silicious sandstones of Chittagong, Arracan, and the Pegu Yomah nourish chiefly upper mixed forests of lofty growth and tropical forests, while the schistose and gneissous formations of Martaban and Tenasserim bring about a less distinct demarcation between the various forests, for here are the mixed, tropical, and eng forests often enough intermixed or regulated more by exposure and amount of moisture than by substratum. Calcareous strata, whether entirely composed of limestone or in combination with other rocks, call into existence the dry forests of Prome, and probably also other varieties of forest in Ava and Tenasserim. Laterite—this most remarkable rock so greatly developed in India—influences forests more than any other (except saline) substrata; and the "red soil," as it is usually called by the practical man, is always accompanied by open forests, more especially the eng forests, whether these beds crop out along the outskirt of the hill ranges or overlay their very ridges. The saline soils, such as are skirting all the sea shores (except where sandy beaches or rocky ground intercepts them), produce everywhere the littoral forests, and the mangrove forests are those which one first beholds on nearing land within the tropics, be it India, Australia, America, or Africa.

In ascending the hills we again meet with forests different from those in the plains, and these again are influenced by the degree of elevation and by all those factors to which I have alluded to as regulators of vegetation in the plains. Here, at elevations from 3,000 to 3,500 feet, we enter the pine, oak, and other subtemperate forests, where rhododendra, violets, and other homely flowers greet the eye.

I now pass on to the description of the varieties of forests represented in Burma. In doing so I have reduced the minor varieties established by me in my preliminary report, and collected them into eight principal divisions, half of which belong to the class of evergreen and the other half to that of deciduous forests. An

appendix treats cursorily also the bamboo jungles, savannahs and deserted toungyas, all these not being strictly forests.

A.—Evergreen Forests.

I. Littoral forests.	III. Tropical forests.
II. Swamp forests.	IV. Hill forests.

B—Deciduous or Leaf-shedding Forests.

V. Open forests.	VII. Mixed forests.
VI. Dry forests.	VIII. Dune forests.

Appendix.

1. Bamboo jungles and savannahs.
2. Deserted toungyas or poonzohs.

A—EVERGREEN FORESTS.

The evergreen forests consist of trees which are green all the year round, although a few of them shed their leaves after a certain number of years. In higher elevations of the Martaban and Tenasserim hills they become intermixed with winter-deciduous trees, but these latter are so scanty as not to affect the aspect.

I. Littoral Forests.—These are low-land forests growing on the silty alluvial lands bordering the sea. But they ascend also the larger rivers as far as the tidal waves. Salt water is the modifying agent of these forests, and they differ in their aspect according to the saltiness of their waters, as affected by the influx of fresh water from the rivers or from rains. Along the sea itself, and often far extending into it, form mangrove forests, consisting chiefly of rhizophors, such as pyoo (*Rhizophora, Bruguiera,* etc.), kambala (*Sonneratia apetala*), tamoo (*Sonneratia acida* and *S. Griffithii*), boo-tayat (*Aegiceras corniculata*), pinlay-kanazoo (*Carapa obovata*), and other smaller trees, like *Kandelia Rheedei, Ceriops, Lumnitzera racemosa, Scyphiphora hydrophyllacea,* and sometimes *Brownlowia lanceolata.* The ground is muddy in the extreme, and more or less destitute of vegetation. Further inland, where the grounds are inundated only during spring-tides, these mangrove forests pass into the so-called tidal forests, in which most of the above-named trees become more subordinate, while kambala trees (*Sonneratia apetala*) and tha-me (*Avicennia tomentosa*) prevail, and to these associate chiefly thim-ban (*Hibiscus tiliaceus*), *Thespesia populnea,* penglai-kanazo (*Heritiera minor*), thin-win (*Pongamia glabra*), *Tamarix Indica,* ta-yau-ben (*Excœcaria agallocha*), kinbalin (*Antidesma diandrum*), kone-kathit (*Erythrina ovalifolia*), yay-chin-ya (*Dalbergia spinosa*), ka-lwa (*Cerbera odallam*), tha-nat (*Cordia myxa*),

thin-boung (*Phœnix paludosa*), and several other less conspicuous trees. Shrubbery is much developed, of which may be worth mentioning kaya (*Acanthus ilicifolius*), pinlay-kyoung-ben (*Clerodendron inerme*), kayoo (*Pluchea Indica*), tamazoke (*Glochidion multiloculare*), *Aegialitis annulata*, etc. These are often intertwined by mee-kyoung-nway (*Derris scandens*), *Derris uliginosa*, myouk-gong-nyin (*Derris sinuata*), *Acanthus volubilis*, shway-nway-pan (*Cassytha filiformis*), asclepiads, such as *Finlaysonia*, *Sarcolobus*, *Hoya*, etc., and some others. A fern (*Acrostichum aureum*) forms dense patches, and so do locally some coarse grasses, chiefly *Cyperus incurratus* and other species, pan-yin (*Andropogon muricatus*), *Leptochloa Wightii*, *Eragrostis procera*, *Scirpus pectinatus*, etc., along with a few herbs which spring up in more open localities. Da-ne (*Nipa fruticans*) and tha-kyet (*Pandanus fœtidus*) form locally dense bushes, especially the first named.

II. Swamp Forests.—These are inland forests which occupy the low-lands and depressions of the alluvial plains. They are usually situated along river-courses or border the numerous lakes. The ground is nearly as muddy as in the mangrove swamps, but it is fresh water that influences the tree-growth here. During the rains they are more or less inundated (often up to 4-5 ft. and possibly more). The trees are for the greatest part altogether different from those of the other forests near or around them, but many of them, if not all, are again found along marshy river sides, or around jungle swamps in the midst of other forests. They are chiefly small-leaved kinds, such as yoong (*Anogeissus acuminatus* var.), thayet (*Mangifera longipes*), thit-pyoo (*Xanthophyllum glaucum*); further, *Memecylon plebejum*, *Elæocarpus hygrophilus*, *Ixora parviflora*, and *I. nigricans*, *Gonocaryum Lobbianum*, *Dhay-lay-ben* (*Symplocos leucantha*), a species of *Xylosma* (probably *X. longifolium*), yai-tha-byay (*Eugenia operculata*), yagine (*Hymenocardia Wallichii* and *H. plicata*), *Morindopsis capillaris*, *Webera myrtifolia*, kyay-nee (*Barringtonia acutangula*), *Garcinia succifolia*, and many kinds of shrubs, climbing as well as erect, are found here, e. g., *Capparis disticha*, yay-kadat (*Crataeva hygrophila*), *Jasminum scandens*, *Gmelina Asiatica*, nga-phyoo (*Pachygone odorifera* and *Roydsia obtusifolia*), *Sphenodesma grossum*, a *Tetracera*, bambhæ-nway (*Ancistrocladus Griffithii*), souw-pein-nway (*Combretum trifoliatum*, and *C. tetragonocarpum*), *Derris elegans*, *uliginosa*, and *scandens*, soo-yit (*Acacia pennata*), etc. Herbage is scanty, but thin-pen or pin-pwa (*Phrynium dichotomum*) is abundant, and so are in places za-yap (*Lasia*) and several kinds of sedge-grasses. Palms or bamboos are absent. Orchids and ferns abound more or less on the trees.

III. Tropical Forests.—A characteristic dense mass of trees covers the shady valleys and shady slopes of the hilly country, and indeed wherever shelter and perennial supply of fresh water allows

their development. These forests are highly developed from Martaban down to Tenasserim and the Andamans; also the Arracan Yomah and the mountainous parts of Ava show a preponderance of tropical forest. But in the lower Chittagong hills, and all along the Pegu Yomah, they retreat to the deep valleys, while they are almost absent in the drier districts of Prome and Ava. The variety of trees in these forests is so great as not to allow me to draw up a correct picture of this forest, for its constituents vary greatly in forest tracts close to each other. The lofty trees towering above the dense forest mass are chiefly leaf-shedders, especially thee-hpyoo (*Sterculia scaphigera*), let-kope (*Sterculia fœtida*), and *Sterculia campanulata*, thit-pouk (*Tetrameles nudiflora*), myouk-tanyet (*Parkia leiophylla*), maya-nheng (*Acrocarpus fraxinifolius*), kokko (*Albizzia Lebbek*) and bo-may-za (*Albizzia stipulata*), pyen-kadoo (*Xylia dolabriformis*), thayet-san (*Swintonia Schwenckii*), padouk (*Pterocarpus Indicus*), myouk-gnoo (*Duabanga sonneratioides*), toung-peing-nay (*Artocarpus chaplasha* and *Art. rigida*), myouk-loke (*Artocarpus Lacoocha*), kathit-ka (*Pentace Burmanica*), also a good number of lofty wood-oil-trees, such as kanyin-hpyoo (*Dipterocarpus alatus*), Kanyin-nee (*Dipterocarpus lævis* and *D. turbinatus*), thin-ga-doo (*Parashorea stellata*), thin-gan (*Hopea odorata*), koung-mhoo (*Anisoptera glabra*); further, *Payena paralleloneura*, hmya-sait (*Antiaris toxicaria*), htaip-kouk-pen (*Guatteria lateriflora*), and many others. The number of less lofty trees is considerable, and includes such trees as nyoung-ben (*Ficus laccifera*, and other species), *Mitrephora vandæflora*, tadee (*Bursera serrata*), kway-douk (*Kurrimia robusta*), chay-ben (*Semecarpus albescens*), *Marlea*, *Stereospermum fimbriatum*, kyo-ben (*Vitex peduncularis*), yuay-kyee (*Adenanthera pavonina*), thit-kadoo (*Cedrela toona*), pyenma-hpyoo (*Lagerstræmia calyculata*), zoung-ka-lay (*Lagerstr. villosa*), laiza (*Lagerstr. tomentosa*), thayet (*Mangifera Indica*), thin-min, (*Podocarpus polystachya*), thit-to (*Sandoricum Indicum*), nyoung-kyap (*Ficus obtusifolia*), nyoung-chin (*Ficus infectoria*), nyoung-peing-nai (*Ficus nervosa*), tha-hpan (*Ficus glomerata*), especially along choungs, than-that (*Albizzia lucida*), tanyeng (*Pithecolobium angulatum*), thit-nee (*Amoora Rohituka*), *Dysoxylon* and other *Meliaceæ*, *Diplospora singularis*, yay-hmyot (*Trewia nudiflora*), yue-woon (*Hibiscus macrophyllus*), sha-wa (*Sterculia ornata*), *Elæocarpus*, etc. A host of small trees vegetate under the shade of these trees, but I can mention only a few of them, such as nagyee (*Pterospermum*, 2-3 species), madaw (*Garcinia xanthochymus*), *Dalbergia cana*, several species of *Diospyros*, *Phœbe pubescens*, nalingyo (*Cinnamomum*), several kinds of ongtong (*Tetranthera*), and numerous other *Laurineæ*, Karloh (*Hydnocarpus heterophyllus*), myouk-oksheet (*Siphonodon celastrinus*), kana-zoo (*Baccaurea sapida*), *Micromelum pubescens*, touk-sha-ma (*Turpinia*

pomifera), sa-kue (*Webera oppositifolia*), *Aylaia*, *Holigarna Helferi*, *Mæsa ramentacea*, se-than-ya (*Gelonium multiflorum*), gyeng-maoke (*Ardisia humilis* and *A. anceps*), numerous fig-trees, like sintha-hpan (*Ficus regia* and *F. Roxburghii*), kway-tanyin (*Millettia atropurpurea*), yay-kathit (*Erythrina lithosperma*) along open choungs, *Eugenia formosa* and numerous other species, *Memecylon celastrinum*, thit-sap (*Aporosa villosula*), *Cupania*, *Cleistanthus myrianthus*, *Sumbavia macrophylla*, *Cleidion Javanicum*, toung-hpet-wan (*Macaranga gummiflua*), le-loon-ben (*Excœcaria baccata*), thit-cha (*Castanea Javanica*), *Cyathocalyx Martabanicus*, toung-tha-lai (*Garcinia kydia*), *Garcinia cornea*, tha-nat-taw (*Garcinia heterandra*), tseik-chay (*Pancovia rubiginosa*), *Glycosmis*, tha-nat-kha (*Murraya exotica*), *Picrasma Javanica*, yo-dayah (*Ochna Wallichii*), *Heynea trijuga*, *Evonymus*, several species of *Diospyros*, e. g., *D. oleifolia*, *variegata*, etc., kyet-mouk (*Nephelium hypoleucum*), *Linociera terniflora*, Kimbalien (*Antidesma pubescens*, etc.), kyai tha (*Barringtonia racemosa* and *B. pterocarpa*), *Vitex heterophylla*, several nutmegs, like za-deip-hpo (*Myristica longifolia*), thit-tan (*Myristica corticosa*), *Myristica Irya*, *Lepisanthes Burmanica*, etc. Numerous other trees occur in this sort of forest on the Andamans, which are not found or are very rare on the continent, like kappalee-thit (*Mimusops littoralis*), restricted to the coasts, *Hemicyclia Andamanica*, *Dipterocarpus Griffithii*, gangaw or ganggo (*Mesua ferrea*), *Terminalia procera*, *Lagerstræmia hypoleuca*, paga-nyet-soo (*Pometia tomentosa*), *Dracontomelon sylvestre*, pan-ta-ka (*Calophyllum spectabile*), *Fagræa racemosa*, *Pandanus Andamanensium*, etc. As a rule, those tropical forests which grow on metamorphic rocks are richest in species, while those occurring on the soft sandstone and other sedimentary rocks are poorest in this respect. The shrubby vegetation is densest along open water-courses, in cleared spots and along the outskirts of the forest, and often disappears entirely in the depth of the dark interior. It consists of such a large variety that I cannot undertake to sum up the species. Not a few of them are very powerful climbers, ascending into the crowns of the loftiest trees and depending from them in various festoons, or intertwined, or creeping from tree to tree. Amongst these climbers reckon also numerous rattans like yamata (*Calamus latifolius*), yamata-khyeing (*Calamus paradoxus*), *Calamus tigrinus*, etc., and also a bamboo called wa-nway (*Dinochloa Maclellandii*; on the Andamans replaced by *Din. Andamanica*). Bamboo often forms a conspicuous undergrowth, consisting of wa-pyoo-gyee (*Gigantochloa macrostachya*), waya (*Dendrocalamus longispathus*), kyattoun-wa (*Bambusa polymorpha*) and wa-tha-bwot (*Pseudostachyum Helferi*); the gigantic wabo or kyellowa (*Bambusa Brandisii*) grows up to a height of 90 to 100 feet. Palms and screw-pines are dispersed through the forest, but sometimes form almost impenetrable thickets, especially toung-ong (*Arenga sacchari-*

fera), kwam-thi (1 or 2 species of *Areca*), yingan (*Zalacca Wallichii*), minbo (*Caryota sobolifera*), tsaloo ben (*Licuala peltata*), and more especially dhanoung (*Calamus arborescens*) and theing (*Calamus erectus*). Ferns of various sorts and *Scitamineæ* and numerous other herbs, but hardly any grasses, mat the ground in places where the jungle is not too dark.

In some tracts, especially in the larger valleys of the eastern slopes of the Pegu Yomah, tropical and mixed forest become to a certain degree fused, and form a more open but high-grown forest. Owing to the free access of light, the ground becomes here overrun with *Acanthaceæ*, *Clerodendron*, kadoo (*Blumea*), and other compositæ, kat-say-nai (*Sida*),—in short, with such herbage as we find again in the lower mixed forests. This sort of forest, which I distinguished as OPEN TROPICAL FOREST, is merely a slight variety of the tropical forests produced by the influence of light and by a more open terrain.

IV. HILL FORESTS.—At higher elevations, say from 3,000 or 3,500 feet and upwards, the tropical forest becomes greatly influenced, not only by the greater dampness, but also by a lower temperature. Tree-growth is here prodigiously developed, and numerous trees appear which are not represented at lower levels, such as diverse species of oak (*Quercus*) and chestnuts, kyanza (*Castanea tribuloides*, etc.), and other cupuliferous trees; *Ternstræmia japonica*, *Bucklandia populnea*, kinds of thabyay (*Eugenia*) different from those of the plains; temperate *Laurineæ*, *Ostodes paniculata*, thinwin (*Podocarpus*), etc. Palms become less conspicuous, and there appear numerous small trees peculiar to this region. The soil-clothing, too, is different from that below. On the other hand, many trees numerously represented in the hot low-lands disappear now altogether or become very scarce. These are principally members of *Dipterocarpeæ*, *Meliaceæ*, *Sapindaceæ* (except *Acer*), *Dilleniaceæ*, *Sterculiaceæ*, *Anacardiaceæ*, *Lythrarieæ*, and *Sapotaceæ*.

These forests, which I distinguished as the DAMP HILL FORESTS, in contradistinction to the DRIER HILL FORESTS (presently to be discussed), are the least explored in Burma, but they may be considered to form a transition from the true tropical forests to the DRY HILL FORESTS which occupy the exposed ridges and sunny slopes of the hills.

The DRIER HILL FORESTS differ already considerably from the damp ones, being composed of low-grown and higher up often crooked trees; while the pines, which here appear in force, remove our thoughts from tropical scenery. According to the prevalence of pines, we might classify these hill forests thus :—

A—Leaved forests.

1. Damp hill forests, already treated above.
2. Drier hill forests.

B—Coniferous forests.

3. Pine forests.

Further study of the hill forests may likely cause a further sub-division, but for the present purpose I may restrict them to these three varieties only.

These drier hill forests form the nearest approach to the temperate forests of our northern zone, and many an old acquaintance (although specifically different) is met with in them. The trees are for the greatest part still evergreens, in which respect they differ greatly from the true temperate forests (which occur also on the higher Alps of India, as on the Himalaya, above 8,000 to 9,000 feet elevation). In aspect they agree with the forests found on the hills of Southern Europe, but are much more damp, and consist of a far greater variety of trees much clothed with epiphytical plants. The demarcation, however, of this kind of forest with the neighbouring damp hill forests, and of this last variety with the tropical forest, is often rather arbitrary.

The trees here represented are chiefly oaks or kyanza, and chestnuts or thitcha; further, *Myrica sapida*, *Rhododendra* and *Vaccinia*, *Turpinia Nepalensis*, *Bucklandia populnea*, several species of *Symplocos*, tau-lepet (species of *Eurya*), *Anneslea monticola*, pan-ma (*Schima Noronhæ*), two species of *Pyrenaria*, *Echinocarpus*, *Cornus oblonga*, *Diospyros mollis*, *Andromeda ovalifolia*, *Daphnidium caudatum*, *Aperula*, and several other laurels, *Helicia*, *Garcinia anomala*, *Pithecolobium montanum*, bo-mai-za (*Albizzia stipulata*) ascended from below, *Dillenia aurea*, *Wendlandia ligustrina*, a few araliaceous trees, chiefly *Heptapleurum*, etc. A fan-palm (*Chamærops khasiana*) looks rather strange in such a society, and a climbing *Plectocomia* ascends up to 7,000 feet elevation. Bamboo is still represented by a berry-bearing half-scandent kind (*Pseudostachyum glomeriflorum*), and higher up a small *Arundinaria* forms a very dense undergrowth, especially above 6,000 feet elevation. The ground is clothed with grass and herbs wherever light has free access; brackes (*Pteris aquilina*), *Rubus*, Gentians, *Galium*, *Saussurea*, *Gnaphalium* and *Anaphalis*, Sun-dew, *Lobelia*, *Senecio*, *Bupleurum*, and some other umbellifers are some of the European plants which grow rather profusely on the pastures that occupy the exposed slopes. One or two kinds of violet, too, are frequently met with along choungs in the valleys. Epiphytes, orchids as well as ferns, *Cyrtandraceæ*, etc., interwoven with mosses and lichens, cloth the branches.

Along the more exposed ridges and unfavourably exposed slopes, these forests become quite stunted and the tree-stems gnarled, and form then the variety called STUNTED HILL FORESTS. They form the upper limit of the hill forests in Burma, where (for example, below the top of the Nattoung) the Arundinarias and Rhododendra become quite dwarfed and reduced.

The PINE FORESTS are either quite or nearly free of leafed

trees, but the gullies and valleys that intersect them are usually more or less taken up by drier hill forests, or both pines and leafed trees are intermixed. They consist entirely of tinyoo (*Pinus Kasya*) and occupy the hilly parts of the Lushai country, Upper Ava, and Martaban. The lowest limit to which they descend is (I believe) about 3,500 feet. In Upper Tenasserim another pine makes its appearance, *viz.*, *Pinus Merkusii*, which occurs chiefly on the sandstone hills of the Thounggyeen in Upper Tenasserim and re-appears again on the hills of Sumatra. Forests of this pine are found at such low levels as 1,500 feet, and single trees are locally found at only 500 ft. elevation.

B—DECIDUOUS OR LEAF-SHEDDING FORESTS.

From a general point of view the deciduous forests divide into two large classes. The first one consists of trees which shed their leaves by the influence of cold, and are therefore leafless during the winter or cold season. But here again we have to distinguish between winter-deciduous trees, *i. e.*, trees which grow in regions or zones where snow falls, and cold-season shedders, which are not subjected to the influence of a severe winter cold, but, for some reason or other, shed their leaves after the rains instead at the beginning of the hot season. This latter sort of tree occurs also in Burma, but these are here very subordinately dispersed through the forests. The second principal class of deciduous forests are composed of hot-season shedders, *i. e.*, trees that shed their leaves on account of the dryness and excessive summer heat. It is with this class of forest that the forester in Burma has chiefly to do, for the most important timber trees are found in some of their varieties. The variety of trees in all these forests is so much less than in the evergreen forests that it is more easy to master their constituents and to define their peculiarities.

V. Open Forests.—The open forests are restricted to the diluvium or older alluvium, and occur more especially on laterites, whether this rock is the product of decomposition or not. Those growing in the hills show many transitions to the drier hill forests; indeed, grow sometimes intermixed with them, especially when occupying the débris of metamorphic rocks, as is the case on the Martaban hills. Those growing on stiff clay and loam similarly mix with the lower mixed forests, along the line of their contact. In their typical form as eng forest, they occupy the laterite beds and form a very marked vegetation. I distinguish, therefore, three varieties:—

1. Eng or laterite forests.—The principal constituents of this forest are byoo (*Dillenia pulcherrima*), phthya (*Shorea obtusa*), engyeen (*Pentacme Siamensis*), joeben (*Walsura villosa*), moon-

deing (*Lophopetalum Wallichii*), myoukzee (*Zizyphus jujuba*), lam-bo (*Buchanania latifolia*), thit-say (*Melanorrhœa usitata*), dan-yat (*Symplocos racemosa*), tay (*Diospyros Birmanica*), tasha (*Emblica officinalis*), ziphyoo (*Emblica macrocarpa*), engyen (*Aporosa macrophylla*), yemine (*Aporosa villosa*), yindyke (*Dalbergia cultrata*), *Wendlandia tinctoria*, toukkyan (*Terminalia macrocarpa*), banbwe (*Careya arborea*), kone-pyenma (*Lagerstræmia macrocarpa*), kha-boung (*Strychnos nux vomica*), nabbhay (*Odina wodier*), yingat (*Gardenia obtusifolia*), tha-meng-sa-nee (*Gardenia turgida*), tha-byay-hpyoo (*Eugenia jambolana*), *Sideroxylon parvifolium*, na-yu-wai (*Flacourtia sapida*), and others. The eng (*Dipterocarpus tuberculatus*) is the characteristic tree of this forest. Moondein (*Cycas Siamensis*) is plentiful in the Prome forests. Palms are represented only by a stemless date palm (*Phœnix acaulis*) called thin-boung, and here and there by an erect, much-reduced rattan called kyeing-kha (*Calamus gracilis*). Of bamboo are seen only myin-wa (*Dendrocalamus strictus*), and less so tei-wa (*Bambusa tulda*), along the outskirts of the forest. Climbing vegetation has almost disappeared. Ferns are rare, but orchids and some asclepiads are plentiful. The shrubs here are meagre and sparse, but still exhibit a great variety of species, and the same may be said of the clothing of the ground. The display of gaudy flowers during the hot season, on trees as well as on the ground, is often very striking. Where depressions occur, they are usually filled up with stiff clay inundated during the rains, and such places are more or less densely covered by thin dry grass and sedges.

2. Hill eng Forests.—These forests occupy the ridges of the outer hill ranges of Martaban and Upper Tenasserim, where they luxuriate either on laterite formed by decomposition of the underlying rock or on débris of metamorphic rocks. In general aspect they agree with the eng forests of the plains, but numerous trees occur in them which are peculiar to them, or very rare in those of the plains. The eng tree (*Dipterocarpus tuberculatus*) is still represented here, but is also often replaced by, or intermixed with, two other wood-oil trees, *viz.*, *Dipterocarpus costatus* and *D. obtusifolius*. Other conspicuous trees are *Engelhardtia villosa*, *Quercus Brandisiana*, and *Q. Bancana*, pan-ma (*Schima Bancana*), thit-say (*Melanorrhœa glabra*), *Castanea tribuloides*, *Tristania Burmanica*, *Anneslea fragrans*, etc. Various trees of the true eng forests and sometimes of the drier hill forests associate, like doung-hsap-pya (*Callicarpa arborea*), *Dillenia aurea*, *Rhus Javanica*, *Vernonia acuminata*, etc. These hill eng forests require further study.

3. Low Forests.—These are only a modification of the true eng forest, being, so to say, a mixture of trees from the lower mixed forests with eng forest trees. The stiff clay on which they grow does not allow the eng tree to vegetate, and, indeed, all the laterite

steady trees, such as phthya, engyeen, etc., disappear, while certain trees, like yindyke (*Dalbergia cultrata*), toukkyan (*Terminalia macrocarpa*), khaboung (*Strychnos nux vomica*), etc., often become very prevalent.

VI. Dry Forests.—Travelling northwards and leaving the alluvial and silicious sandstone formations, we enter, in Prome, peculiar forests growing chiefly on calcareous sandstone, but often intermixed with, or passing into, eng forests, where gravelly or ferruginous deposits overlie the sandstone. These are the dry forests characterised by a number of trees that are not found elsewhere except on calcareous substrata, and not a few of which turn up again in Hindustan. They are chiefly formed of a sha (*Acacia catechu*), ta-noung (*Acacia leucophlœa*), engyeen (*Pentacme Siamensis*), sha-pyoo (*Sterculia versicolor*), *Hiptage albicans*, ta-pooben (*Harrisonia Bennettii*), ta-ma-kha (*Melia Azedarach*), on the hills, yeng-ma or yimma (*Chickrassia velutina*), zi-ben (*Zizyphus jujuba*), chope-ben (*Diospyros montana*), nebbhoo (*Combretum apetalum*), tha-lai (*Ulmus lancifolia*) on the hills, than-tat (*Albizzia lucida*), bai-bya (*Cratoxylon neriifolium*), ta-nap (*Tectona Hamiltonii*) locally, khoosan (*Hymenodictyon thyrsiflorum*), ta-pouk-ben (*Dalbergia paniculata*), thit-sa-nweng (*Dalbergia nigrescens*), letkope-gyee (*Holarrhena antidysenterica*), khaboung (*Strychnos potatorum*, and *St. nux-vomica*), hpalan (*Bauhinia racemosa*), bwe-cheng (*Bauhinia variegata*), na-yu-wai (*Flacourtia sapida*), *Ehretia lævis*, *Rhus paniculata*, *Morinda tomentosa*, nabbhay (*Odina wodier*), ta-sha-ben (*Emblica officinalis*), thabyay-hpyu (*Eugenia jambolana*), kyet-yo (*Vitex alata*, and *V. limonifolia*), *Vitex canescens*, koung-khwa (*Capparis auricoma*), *Premna viburnoides*, tha-khwot-ma (*Spathodea Rheedei*), etc. With these associate numerous other trees as well from the eng forests, like eng (*Dipterocarpus tuberculatus*), here and there, phthya (*Shorea obtusa*), lambo (*Buchanania latifolia*), tay (*Diospyros Birmanica*), and such like; as also from the mixed forests, like gyo-ben (*Schleichera trijuga*), bingah (*Nauclea rotundifolia*), pyen-kadoo or pynkado (*Xylia dolabriformis*), kokko (*Albizzia Lebbek*), thit-po (*Dalbergia purpurea*), kyoon-naleng (*Premna tomentosa*), teak of inferior growth, yoong (*Anogeissus acuminatus*), didoo or letpan (*Bombax*), chin-youk (*Garuga pinnata*), etc. The shrubbery is scanty and similar to that of the eng forests, but of a more thorny or prickly nature. Several species of arboreous *Euphorbiæ* (*E. nivulia* and *E. antiquorum*), called sha-zoung, attract the eye on account of their curious shape and growth. Palms and bamboos are the same as those observed in the eng forests.

The sha-tree (*Acacia catechu*) often gets the supremacy, and there are not a few pure or almost pure sha forests in the Prome District.

Higher on the ridges, above 2,000 feet elevation, a small crooked tree (*Hiptage albicans*) appears in force, associating with similarly crooked low trees of yindyke (*Dalbergia cultrata*), bwé-cheng (*Bauhinia variegata*), didoo (*Bombax insigne*), ta-sha-ben (*Emblica officinalis*), zeng-byoon (*Dillenia pentagyna*), and others, and these form the UPPER DRY FOREST. Here also some temperate forms appear for the first, such as an epiphytic beautiful *Vaccinium* (*V. verticillatum*), a large *Heracleum*, *Hymenopogon* (an epiphyte), and a few others.

VII. MIXED FORESTS.—These forests are no doubt the most important ones to the forester in Burma, and occupy at least two-thirds of the whole area of Pegu proper, Chittagong, and Arracan, while they are less developed in Martaban, Tenasserim, and the Andamans. I have adopted (with slight alterations) the varieties of these forests as distinguished by Dr. Brandis in his report on the Attaran forests in 1860. These are now generally understood by foresters in Burma. They are, as a whole, well demarcated in all the tracts west of the Sittang, from Chittagong and Prome southwards; but east of that river, on the metamorphic strata, they become much masked by the surrounding forests. This is no doubt partially owing to the substratum, which is here so favourable to most kinds of trees, while alluvium and the soft sandstone excludes so many kinds that are common enough on metamorphic substrata. On the Andamans they are also less demarcated, although here growing on the same sandstone as that of Pegu, but here the lower latitude and more especially the insular climate, has a share in this modification.

1. UPPER MIXED FORESTS.—These are restricted to rocky and hilly terrains, but differ somewhat in aspect accordingly that they grow on soft silicious sandstone or on metamorphic rocks. On the latter substratum the trees are not so straight and lofty-grown, and accompanied by such trees as padouk (*Pterocarpus*), several *Ternstræmiaceæ*, and certain *Meliaceæ*.

The chief trees are here pyenkadoo or pynkado (*Xylia dolabriformis*), teak or kyoon-ben (*Tectona grandis*), thabyay-hpyoo (*Eugenia jambolana*), didoo or letpan (*Bombax insigne*) with white and scarlet flowers, sha-pyoo (*Sterculia versicolor*), *Sterculia fœtida*, sha-nee (*Sterculia villosa*), nagyee-ben (*Pterospermum semisagittatum*), chin-youk (*Garuga pinnata*), ta-dee (*Bursera serrata*), chyay (*Semecarpus panduratus*), kway (*Spondias mangifera*), panga (*Terminalia tomentella*), toukkyan (*Terminalia crenulata*), lein (*Terminalia pyrifolia*), thit-sein (*Terminalia belerica*), yoong (*Anogeissus acuminatus*), pyenma or peema (*Lagerstræmia flos reginæ*), laizah (*Lagerstræmia tomentosa*), myouk-shaw (*Homalium tomentosum*), tseik-gyee (*Briedelia retusa*), thit-pagan (*Millettia Brandisii*), tha-nat (*Cordia grandis*), yemeneh (*Gmelina arborea*), thit-poh (*Dalbergia purpurea*), nhau-ben (*Nauclea cordifolia*), bingah (*Nauclea rotundifolia*), kyet-yo (*Vitex alata* thin-win (*Millettia leucantha*), ouk-chin-za (*Diospyros chretioides*)

kyoon-na-leng (*Premna tomentosa*), bai-bya (*Cratoxylon neriifolium*), wet-sha (*Sterculia colorata*), mai-zalee or toung-may-za-lee (*Cassia Siamea*), gnoo-theing (*Cassia nodosa*), khaboung (*Strychnos nux vomica*), nabbhay (*Odina wodier*), Dwa-nee (*Eriolæna Candolici*), thit-yin (*Croton oblongifolium*), na-yuwai (*Flacourtia cataphracta*), kadwot (*Ficus hispida*), ye-kha-ong (*Ficus cunia*), kha-ong (*Ficus conglomerata*), and others. Large-sized bamboo, kyattoun-wa (*Bambusa polymorpha*), tin-wa (*Cephalostachyum pergracile*), and in drier situations myin-wa (*Dendrocalamus strictus*), form the chief undergrowth, intermixed with such trees as ling-gyow (*Dillenia parviflora*), zim-byoon (*Dillenia pentagyna*), madama (*Dalbergia ovata* and *D. glauca*), pin-ta-yo (*Grewia elastica*), pyee-sin (*Antidesma Ghæsembilla*), let-tope-thein (*Holarrhena pubescens*), khyoung-ya (*Calosanthes Indica*), sha-ma (*Emblica albizzioides*), ta-sha (*Emblica officinalis*), etc. Palms are represented by zanoung (*Wallichia*), minbo (*Caryota urens*), and a few rattans. Shrubs are here few and meagre. Climbers, although mostly powerful ones, and therefore injurious to tree-growth, play a subordinate rôle. The herbage is scattered, and the grey or yellowish soil is everywhere exposed during the dry season.

The greater moisture and shade along favourably exposed slopes and of deep valleys permits the growth of wood-oil trees or kanyin-hpyoo (*Dipterocarpus alatus*), kokko (*Albizzia Lebbek*), shaw-htoo (*Beilschmiedia Roxburghii*), kyoung-touk (*Payanelia multijuga*), manioga (*Carallia integerrima*), yai-tha-hpan (*Ficus glomerata*), waya (*Dendrocalamus longispathus*), and other shade-loving trees.

2. Lower mixed Forests.—These forests occupy the alluvium and low-lands of the country, and consist greatly of the same kind of trees that grow also in the upper mixed forests. But their growth is much lower, and the undergrowth is also a different one. To those trees already mentioned as growing in the upper mixed forests, must be added chiefly touksha (*Vitex leucoxylon*), Dwa-bote (*Kydia calycina*), didoo (*Bombax malabaricum*), ma-lwa (*Spathodea stipulata*), tha-kwot-ma (*Spathodea Rheedii*), hpet-than (*Heterophragma adenophylla*), thit-magyee (*Albizzia odoratissima*), sit ben (*Albizzia procera*), hteing (*Nauclea diversifolia*), a few species of the section of *Urostigma* of *Ficus*, especially *Ficus geniculata*, gnoo-kyee (*Cassia fistula*), chyay-nee (*Barringtonia acutangula*), mhan-hpyoo (*Randia uliginosa*), hsay-than-paya (*Randia longispina*), mhan-nee (*Gardenia erythroclada*), ma-jee-bouk (*Gardenia sessiliflora*), tabwot-kyee (*Miliusa velutina*), dwa-nee (*Eriolæna Candollei*), myat-ya or myaya (*Grewia microcos*), *Grewia lævigata*, *Casearia canziala*, ta-chanza (*Heteropanax fragrans*), thit-shwey lay (*Schrebera swietenioides*), kyet-yo (*Vitex pubescens*), several kinds of tamazoke (*Glochidion*), nalin-gyo (*Cinnamomum obtusifolium*), bway-cheng (*Bauhinia malabarica*), thit-payong (*Nauclea sessilifolia*), anam or anan-hpo (*Crypteronia paniculata*), here and there kanazœ (*Baccaurea sapida*), *Derris robusta*

and others. The bamboo here is chiefly tinwa (*Ceptalostachyum pergracile*), wa-pyoo-gelay (*Gigantochloa albo-ciliata*), and teiwa (*Bambusa Tulda*), but these are scattered in batches and do not form such an uninterrupted undergrowth as the bamboo on the hills. Climbers are numerous and of various description, and I will mention only the more powerful or more common ones. These are pouk-nway (*Butea superba* and *B. parviflora*), kong-nyin-nway (*Entada scandens*), tha-bwot-nway (*Uvaria macrophylla*), tau-zee-nway (*Zizyphus œnoplia*), kway-nway (*Colubrina pubescens*), several vines, but chiefly yin-noung-nway (*Vitis Linnæi*), chindouk-nway-zouk (*Vitis latifolia*), woon-oo-nway or myæ-zoo-nway (*Vitis erythroclada*), yin-noung-peing-nway (*Vitis auriculata*), kyee-nee or kyee-chee-nway (*Vitis lanceolaria*), further, da-ma-gnai-nway (*Millettia extensa*), nway-bouk (*Pæderia lanuginosa*), kyoung-chet (*Mezoneuron cucullatum*), kyoung-gyet-nway (*Pterolobium macropterum*), soo-yit (*Acacia pennata*), soo-pwot-ka-lay-nway (*Acacia glaucescens*), douk-ta-long (*Dalbergia stipulacea*), *Pueraria Candollei*, kway-lay-nway (*Mucuna prurita*), kway-la-bwot-nway (*Canavalia lucens*), ba-loo-let-wa (*Heptapleurum venulosum*), sin-ma-no-pyin (*Briedelia stipularis*), naleing-bo (*Mallotus repandus*), tha-ma-kha-nway (*Congea tomentosa*), nway-sat-nway (*Symphorema involucratum*), ka-nway (*Symphorema unguiculatum*), several species of *Combretum*, like kyet tet-nway (*Comb. squamosum*), mho-mha-ka-nway (*C. extensum*), and tha-ma-ka-nway (*C. decandrum*), kywot-nay-nway (*Calycopteris Roxburghii*), several cucurbits, nway-cho (*Thunbergia laurifolia*), na-sha-gyee (*Cryptolepis Buchanani*), *Fagræa obovata*, some very showy flowered *Convolvulaceæ*, like oomen (*Ipomœa xantantha*), kya-hin-ka-læ-nway (*Ipomœa vitifolia*), toung-kazun (*Argyreia capitata*), ope-mhon-nway (*Argyreia barbigera*), o-na-kope-nway (*Argyreia populifolia*), and others.

Herbage and shrubbery, although not dense, is more conspicuous, and in places even luxuriant, especially along choungs. Parasitic *Loranthaceæ*, all called kyee-poung, and mistletoes—thit-long of the Burmese—are here more plentiful than in any other forest, except in the savannah forests and in the cultivated plains. As might be expected, teak is of inferior growth, and more dispersed through the forest.

Towards the banks of the larger rivers, coarse grasses (usually called elephant-grass) overrun the whole terrain, and the trees become here very scattered. The subsoil seems to be here greatly water-logged, and hence the trees become very short-stemmed and stunted, for a subterrannean sheet of water acts upon the roots of trees like an impermeable stratum. The trees that can withstand such condition are not numerous, and are chiefly op-nai (*Streblus asper*), pouk (*Butea frondosa*), theing-they (*Nauclea parvifolia*), thit-payong (*Nauclea sessilifolia*), bingah (*Nauclea rotundifolia*), tha-hpan (*Ficus*

Chittagonga), nyoung-hpyoo (*Ficus Rumphii*), yindyke (*Dalbergia cultrata*), thit-poh (*Dalbergia purpurea*), bambwe (*Careya arborea*), pyenma or peema (*Lagerstræmia flos-reginæ*), lein-ben (*Terminalia pyrifolia*), khaboung (*Strychnos nux vomica*), touk-sha (*Vitex leucoxylon*), sha (*Acacia catechu*), kyoon or teak, zi ben (*Zizyphus jujuba*), pyee-zin (*Antidesma ghæsembilla*), nabbhay (*Odina wodier*), mhan-hpyoo (*Randia uliginosa*), tamin-tsa-byoo (*Gardenia sessiliflora*), thit (*Albizzia elata*), ong-tong (*Tetranthera Roxburghii*), and others. Often only one or a few trees mentioned here are found scattered over large tracts of these savannahs. The only bamboo occurring here is kyakatwa (*Bambusa arundinacea*).

VIII. DUNE FORESTS.—These forests offer many peculiarities which make it desirable that they should be separated from the other forests. They partake now more of an evergreen, now of a deciduous forest, and grow exclusively on the calcareous sand consisting of the fine fragments of shells and corals. This sand forms either the beaches of the sea, in which case the area is very small and more or less crescent-shaped. Forests growing on such beaches were called by me BEACH FORESTS, but indeed they are only a very slight variety of the true DUNE-FORESTS. These latter grow on the dunes along the shores, formed by the calcareous sand blown inwards from the sea and archipelago, and are on many islands of the Malay as extensive as are those of Holland, etc. In Burma only beach forests are found, except possibly in Tenasserim, where apparently extensive dunes with typical dune forests (consisting of *Casuarina*, etc.) seem to occur west of Tavoy. They are greatly intercepted by outrunning ridges and the silty debouchures of rivers. The cocoa palm is here restricted to those of the Cocos Islands, and to a few places along the western coast of North Andaman. In those of Burma we find chiefly thin-win (*Pongamia glabra*), pinlay-kathit (*Erythrina Indica*), didoo (*Bombax Malabaricum*), thimban (*Hibiscus tiliaceus*), tsat-tha-poo (*Pandanus odoratissimus*), minga or myeng-ka (*Cynometra bijuga*), *Guettarda speciosa*, mong-taing (*Cycas Rumphii*), *Thespesia populnea*, penglay-htan (*Scævola koenigii*), *Terminalia catappa*, thabyay-phyoo (*Eugenia Javanica*), *Afzelia bijuga*, kyai-kyee (*Barringtonia speciosa*), pong-nyet (*Calophyllum inophyllum*), *Atalantia macrophylla*, *Desmodium umbellatum*, *Hernandia peltata*, *Sophora tomentosa*, nabbhay (*Odina wodier*), *Ochrosia salubris*, *Cerbera odallum*, *Briedelia glauca*, and such like trees. These forests are open and pretty sunny, and shrubs are here plentiful and often entangled with twiners, while creeping grasses (chiefly *Ischæmum muticum*) and *Ipomœas*, especially penglay-kazun (*Ipomœa pes-capræ*), cover the loose sand.

APPENDIX.

1. BAMBOO JUNGLES and SAVANNAHS.—These two varieties can hardly be reckoned amongst forests, although they certainly may be claimed as forest land, being the undergrowth of them.

The BAMBOO JUNGLES are characterised by the great uniformity of their aspect and by the poorness of their undergrowth, no doubt caused by the dense and injurious shade which the bamboo spreads all round. Seldom do we find more than two different kinds of bamboo in the same jungle; they may therefore be best distinguished by the kind of bamboo of which they consist. So we have in Burma jungles of myinwa (*Dendrocalamus strictus*), tin-wa (*Cephalostachyum pergracile*), kyattoun-wa (*Bambusa polymorpha*), wapyoo-gelay (*Gigantochloa albo-ciliata*), or wa-ta-bwot (*Pseudostachyum Helferi*), and others. Kyakatwa (*Bambusa arundinacea*) jungles are found often in the alluvial plains near larger rivers. These bamboos flower all simultaneously after a lapse of years, and then die off. Then numerous light-loving plants and shrubs and also tree seedlings spring up, and it is at such periods that one cannot predict with any certainty whether the next generation will be again a pure bamboo jungle, or whether the saplings of the trees will not get the supremacy, keeping down the young bamboo as undergrowth.

The SAVANNAHS are the undergrowth of the savannah forests, and as such do not differ from these in any point except that they are void, or nearly void, of trees. They seem to owe their existence chiefly to inundation—at least their distribution along the rivers pretty well coincides with the area of regular inundation during the rains. The grasses are all coarse ones,—so coarse, indeed, that the halms of some become as woody as those of certain small bamboos (*Arundinaria*), and grow up from 6 to 10 feet in height. By far the greatest bulk of them consists of theckay kyee (*Saccharum spontaneum*), phounga (*Saccharum procerum ?*), myetya (*Polytoca heteroclita*), kyoo-na-pen (*Arundo Roxburghii*) and kyoo (*Arundo Madagascariensis ?*). Sometimes thet-kai-nyin (*Imperata cylindrica*), a low grass, covers larger tracts. Towards the tidal zone panyin (*Andropogon muricatus*) and wild sugarcane (*Saccharum spontaneum*) are the principal constituents, intermixed with *Eragrostis procera*, *Cyperi*, etc.

2. DESERTED TOUNGYAS or POONZOHS.—Large tracts of forests are yearly felled by the natives for the cultivation of rice. As soon as the harvest of the first, second, or third year is over, these lands are deserted and form toungya poonzoh or briefly poonzohs, *i. e.*, deserted culture-land. Week herbs of cultivation, chiefly light-loving *Compositæ*, *Malvaceæ*, etc., spring up in dense masses, which soon must give way to coarse grasses and shrubs, amongst which

tree seedlings struggle for existence. Often (especially on the hills) coarse grasses soon occupy the whole terrain, and form a sort of hill savannah, consisting usually of ta-mazaing or ta-minsain-ben (*Panicum acariferum*) and myet-ya (*Polytoca heteroclita*), rarely of thekkay-nyin (*Imperata cylindrica*). In other localities where bamboo around such clearings flowered, bamboo seedlings spring up and soon choke all other vegetation, except light-loving, quick-growing sapling trees. Local relations chiefly regulate the nature of the coming jungle, but, as a rule, such deserted clearings revert into forests similar to, or identical with, those that pre-existed on them.

FOREST FLORA OF BRITISH BURMA.

SYNOPSIS OF NATURAL ORDERS.

A. SEED-BEARING PLANTS or PHANEROGAMS.

Plants bearing more or less complete flowers and producing perfect seeds, in which an embryo rests.

Class I. DICOTYLEDONS or EXOGENS.

Stem, when woody, consisting of pith, of one or more concentric circles of fibrous tissue, and of bark on the outside. Embryo with 2 or rarely more cotyledons, the young stem in germination proceeding from between the cotyledons or from a notch at its summit. Flowers often 4- 5- or 6-merous. Leaves net-veined. (By far the greatest portion of Burmese woody plants belong to this class.)

DIVISION 1. ANGIOSPERMS. Ovules enclosed in an ovary with a stigma. Seeds contained in a seed-vessel. Cotyledons usually 2 only.

Sub-class 1. POLYPETALÆ.

Petals several, distinct (wanting in a few genera, very rarely united).

A. Thalamiflorae.—*Torus small or elongated, rarely expanded into a disk. Ovary superior. Stamens indefinite or rarely definite, usually hypogynous.*

1. Ranales.—*Stamens usually indefinite. Carpels distinct, free, or immersed singly in the torus, rarely connate below. Albumen often copious, the embryo usually relatively small.*

* *Petals and sepals in a single series.*

Ranunculaceæ.—Sepals deciduous. Arillus none. Herbs or scandent shrubs, with alternate or opposite leaves. Stipules none.

Dilleniaceæ.—Sepals persistent. Seeds with arillus. Trees or shrubs, sometimes scandent, with alternate simple often scabrous leaves. Stipules none.

* * *Petals or sepals, or both, in two or more series.*

Magnoliaceæ.—Sepals and petals forming three or more series and imbricate in each series. Carpels definite. Shrubs or trees, with alternate leaves.

Anonaceæ.—Sepals 3, petals 6, in two series of 3 each. Carpels usually indefinite, rarely definite or solitary, distinct or rarely (in Anona) connate. Albumen ruminate. Trees or shrubs, often scandent, with alternate simple leaves. Stipules none.

Menispermaceæ.—Flowers small or minute, deciduous. Sepals in two or more series of 3 or 2 each. Petals usually smaller than the inner sepals or wanting. Stamens 6, or 3 to 9, free or connate, opposite the petals. Seeds often horse-shoe shaped. Carpels 6 or fewer. Twiners or shrubs, usually scandent, with alternate leaves. No stipules.

Berberideæ.—Sepals, petals, and stamens each in two or three series of 3 each. Anthers dehiscing by valves. Carpel solitary. Trees or shrubs, sometimes scandent, with simple or compound leaves.

2. Parietales.—*Stamens definite or indefinite. Ovary syncarpous, with parietal placentation, one-celled or spuriously divided by cellular placentary dissepiments. Ovules rarely solitary. Fruits various, always singly from each flower.*

Violaceæ.—Flowers irregular or regular. Petals and stamens 5, the connective produced beyond the anther-cells. Albumen present. Herbs, shrubs, or rarely trees, with simple alternate leaves. Stipules present.

Moringaceæ.—Flowers irregular. Sepals and petals 5. Stamens 5 or 10. Capsule pod-like, 3-valved. Albumen none. Trees, with compound alternate leaves.

Capparideæ.—Flowers regular or irregular. Petals 4. Stamens indefinite, rarely definite. Ovary and fruit often stalked. Seeds often kidney-shaped. Albumen none. Trees or shrubs, often scandent, or herbs, with alternate simple or digitately compound leaves. Stipules often reduced to thorns.

Bixineæ.—Flowers regular. Sepals 5 or fewer. Petals various, often none, not seldom scaled at base. Stamens indefinite, free or connate. Placentas 2 or more. Albumen fleshy. Embryo rather large. Trees or shrubs, with alternate simple leaves. Stipules usually none, rarely minute or conspicuous.

3. Polygales.—*Sepals* 5, *unequal or equal. Petals* 5. *Stamens* 5, 6, *or* 8, *free or monadelphous. Ovary* 2*-merous.*

Pittosporeæ.—Flowers regular or nearly so. Stamens as many as petals. Embryo minute. Seeds albuminous. Trees or shrubs, rarely twining, with simple alternate leaves. Stipules none.

Polygaleæ.—Flowers irregular. Stamens monadelphous. Albumen none or almost none. Embryo rather large. Herbs or perennials, rarely shrubs or trees, with simple alternate leaves. Stipules none.

4. CARYOPHYLLINEÆ.—*Sepals* 5, 4, *or* 2, *free or connate. Petals* 5, *rarely fewer or none, sometimes minute. Stamens* 5 *or* 10, *or numerous. Ovary* 1-*celled, with usually a free central placenta. Albumen mealy. Embryo curved, rarely straight.*

Tamariscineæ.—Sepals and petals each 4 to 6. Stamens as many or twice as many. Placentas 3-4, free, basal. Seeds comose. Small trees or shrubs, with rudimentary or minute scale-like alternate leaves.

5. GUTTIFERALES.—*Sepals* 2 *to* 6 *or more, imbricate. Petals as many, rarely more. Stamens indefinite. Ovary usually syncarpous, with axile placentation.*

Elatineæ.—Flowers small, usually hermaphrodite. Stamens definite. Herbs or undershrubs, with small opposite leaves. Stipules small.

Hypericineæ.—Flowers hermaphrodite. Stamens indefinite, often polyadelphous. Trees, shrubs, or herbs, with opposite or rarely alternate leaves. Stipules none.

Guttiferæ.—Flowers usually dioecious or polygamous. Stamens indefinite, free, or variously connate. Trees or shrubs, often abounding in a yellow or greenish resinous juice, with opposite leaves. Stipules none.

Ternstroemiaceæ.—Flowers hermaphrodite. Stamens indefinite, free, or connate at base. Trees or shrubs, with alternate leaves. Stipules sometimes wanting.

Dipterocarpeæ.—Flowers hermaphrodite. Calyx-lobes usually enlarged in fruit. Trees, rarely shrubs, sometimes scandent, with alternate leaves. Stipules often large.

6. MALVALES.—*Sepals or calyx-lobes valvate in bud. Petals as many as sepals, or none. Stamens monadelphous or free. Ovary syncarpous, with axile placentation.*

* *Anthers* 1-*celled.*

Malvaceæ.—Stamens monadelphous, rarely free, and in this case definite and alternating with the sepals. Herbs, trees, or shrubs, sometimes scandent, with alternate leaves. Stipules present.

* * *Anthers* 2-*celled.*

Sterculiaceæ.—Stamens monadelphous, indefinite or definite, with or without alternating staminodes. Trees, shrubs, or herbs, with alternate leaves. Stipules usually present.

Tiliaceæ.—Stamens indefinite, free or shortly connate at base. Trees or shrubs, rarely herbs, with alternate leaves. Stipules usually present.

B. DISCIFLORÆ.—*Torus usually thickened or expanded into a disk, either free or adnate to the ovary, or to the calyx, or to both, rarely reduced to glands, or wanting. Stamens as many or twice as many as petals, or fewer. Ovary superior, or partially immersed in the disk, divided into cells with axile placentas, or the carpels distinct.*

7. GERANIALES.—*Disk within the stamens, or confluent with the staminal tube, or reduced to glands, or obsolete. Gynoecium lobed or apocarpous, or sometimes entire. Ovules usually* 1 *or* 2 *in each cell, one or both pendulous, with a ventral raphe.*

Lineæ.—Disk small, glandular, or none. Ovary entire, styles free or connate. Ovules usually 2 in each cell. Albumen fleshy, rarely wanting. Herbs or shrubs, rarely trees, with alternate leaves. Stipules usually present.

Malpighiaceæ.—Sepals often with glands on their back. Disk not large. Ovary lobed or apocarpous. Ovules solitary. Fruit-carpels often winged; albumen none. Shrubs, often scandent, rarely trees, with usually opposite leaves. Stipules present.

Geraniaceæ.—Disk reduced to 5 glands or obsolete. Stamens 5 or a multiple of 5, all or only part anther-bearing. Ovary angular or lobed. Ovules 1 or 2, rarely more, in each cell. Albumen none or rarely fleshy. Herbs or shrubs, rarely trees, with alternate or opposite simple or compound not glandular dotted leaves. Stipules usually present.

Rutaceæ.—Disk within the stamens. Ovary entire or lobed, or the carpels distinct, with the styles connate. Ovules 1 or 2 in each cell. Trees, shrubs, sometimes scandent, rarely herbs, with opposite or alternate simple or compound glandular-dotted leaves, the petiole always jointed with the blade. Stipules none.

Simarubeæ.—Filaments usually pilose or with an adnate scale. Ovary lobed. Ovules usually solitary (rarely 2) in each cell. Trees or shrubs, bitter to the taste, with alternate glandless simple or compound leaves.

Ochnaceæ.—Stamens 10 or indefinite; anthers linear, often elongate. Ovary deeply lobed. Fruit-carpels distinct, drupaceous. Trees or shrubs, with alternate simple leaves, the petiole not jointed. Stipules present.

Burseraceæ.—Disk free or adnate to the calyx-tube. Ovary entire. Ovules 2 or 1 in each cell. Albumen none, or fleshy. Trees or shrubs, with balsamic juice and alternate 3- to 1-foliolate or compound glandless leaves. Stipules none.

Meliaceæ.—Stamens 8-10, usually connate in a staminal tube, and the anthers sessile or nearly so, rarely free or nearly so. Ovary entire. Ovules 2, 4, to 10 in each cell. Trees or shrubs, with compound or very rarely simple glandless leaves. Stipules none.

Chailletiaceæ.—Petals 2 cleft. Ovary entire. Ovules 2 in each cell. Trees or shrubs, with simple alternate leaves. Stipules present.

8. Olacales.—*Disk various or none. Ovary entire. Ovules* 1 *to* 3 *in a solitary cell, or* 1 *in each cell, pendulous, with a dorsal raphe, the integuments not distinct from the nucleus. Seeds solitary in the fruit or in the cells. Albumen copious.*

Olacineæ.—Petals free or connate, usually valvate. Ovary 1 or imperfectly 3- to 5-celled. Ovules usually solitary in the cells. Fruit 1-seeded. Albumen rarely wanting. Trees or shrubs, sometimes climbing, with alternate simple leaves. Stipules none.

Ilicineæ.—Petals free, imbricate, rarely wanting. Ovary 3- to 6-celled. Albumen copious. Trees or shrubs, with alternate simple leaves. Stipules none.

9. Celastrales.—*Disk fleshy and thick, free or adnate to the calyx. Stamens rarely more than petals, inserted outside, within or upon the disk. Ovary entire. Ovules* 1 *or* 2 *in each cell, erect, with a ventral raphe.*

Celastraceæ.—Calyx-lobes and petals imbricate in bud. Stamens usually 5 and alternating with the petals, or only 3. Ovary entire or lobed. Trees or shrubs, with simple opposite or alternate leaves. Stipules none, or minute and caducous.

Rhamnaceæ.—Calyx-lobes valvate in bud. Petals small, or none. Stamens opposite the petals. Ovary entire, often inferior. Trees or shrubs, often scandent, with simple alternate or opposite leaves. Stipules usually present.

Ampelideæ.—Calyx-lobes imbricate. Petals valvate. Stamens opposite the petals. Ovary entire. Albumen cartilaginous. Embryo small. Shrubs or herbs, often scandent, with jointed stems and alternate compound or simple leaves, the base of the petiole usually expanded into a stipule.

10. Sapindales.—*Disk various. Ovary entire or lobed. Ovules* 1 *or* 2, *rarely more, in each cell, ascending, pendulous or laterally attached. Flowers often unisexual or polygamous. Leaves generally compound.*

Sapindaceæ.—Style 1. Ovules ascending or horizontal. Trees or shrubs, rarely herbs, with alternate usually compound leaves.

Sabiaceæ.—Stamens often unequal in size and some imperfect, opposite the petals. Trees or shrubs, with alternate simple or compound leaves.

Anacardiaceæ.—Styles 1 to 4, or the stigmas almost sessile. Stamens alternate with the petals. Ovules solitary, suspended or laterally attached. Trees or shrubs, usually abounding in resinous juice, with alternate or often crowded simple or compound leaves.

C. Calycifloræ.—*Stamens and petals usually inserted on the margin of a thin disk lining the base or the whole of the calyx-tube, and free from the ovary unless the calyx-tube is also adnate to it. Stamens definite or indefinite. Ovary either free and superior, or enclosed in, or inferior and adnate to, the calyx-tube.*

11. Rosales.—*Flowers regular or irregular, usually hermaphrodite. Stamens more or less distinctly perigynous. Styles distinct.*

Connaraceæ.—Flowers regular. Stamens definite. Carpels free, 1 to 5. Ovules 2, ascending, orthotropous. Trees or shrubs, often scandent, with 1- to 3-foliolate or pinnate leaves.

Leguminosæ.—Ovary free, composed of a single excentrical carpel with a terminal style, the ovules inserted along the upper or inner angle of the cavity. Albumen often scanty or none. Trees, shrubs, or herbs, climbing or erect, with alternate or rarely opposite often compound leaves. Stipules rarely wanting.

Rosaceæ.—Flowers usually regular. Stamens often definite. Ovary consisting of 1 or more free or afterwards combining carpels, rarely entire; styles usually distinct. Ovules usually 2, anatropous. Albumen usually none. Trees, shrubs, or herbs, with simple or compound alternate leaves. Stipules present.

Hamamelideæ.—Trees or shrubs. Leaves opposite. Flowers often achlamydeous, and usually in heads. Ovaries and carpels fewer than floral parts. Ovules often 1 or 2 in each cell, suspended.

12. Myrtales.—*Flowers regular or almost so, usually hermaphrodite. Pistil syncarpous, inferior (or free in some Rhizophoreæ); styles* 1 *to* 5. *Leaves simple.*

Rhizophoreæ.—Trees or shrubs, often maritime, with opposite leaves. Stipules deciduous. Flowers regular. Calyx-lobes valvate. Petals often notched or jagged. Stamens twice as many as petals, or more. Ovary usually inferior, several-celled, with 2 or more ovules suspended from the apex. Style undivided. Seeds usually solitary, with or without albumen, often germinating while still on the tree.

Combretaceæ.—Flowers regular or nearly so. Stamens definite or rarely indefinite. Ovary inferior, 1-celled, with 2 or more (rarely 1) ovules suspended from the apex of the cell. Style undivided. Seed solitary, without albumen. Cotyledons convolute. Trees or shrubs, sometimes climbing. Leaves opposite or alternate, without stipules.

Myrtaceæ.—Flowers regular or nearly so. Calyx-lobes and petals usually imbricate. Stamens indefinite or rarely definite ; anthers opening by longitudinal slits or rarely by terminal pores. Ovary inferior, 2 or more-celled, with 2 or more ovules in each cell, or rarely 1-celled with a single placenta. Style undivided. Seeds without albumen. Cotyledons flat or folded, not convolute. Trees or shrubs, with opposite or alternate often dotted leaves. Stipules none.

Melastomaceæ.—Flowers regular or nearly so. Petals twisted. Stamens definite ; anthers opening in terminal pores, very rarely in longitudinal slits. Ovary inferior or enclosed in the calyx, 2 or more-celled, with 2 or more ovules in each cell, or rarely 1-celled with a central placenta. Style undivided. Seeds without albumen. Cotyledons flat or folded, not convolute. Shrubs, or rarely trees or herbs, with opposite not dotted leaves. No stipules.

Lythrarieæ.—Flowers regular or nearly so. Calyx-lobes valvate. Petals usually crumpled in the bud. Stamens definite or rarely indefinite. Ovary usually enclosed in the calyx-tube, 2 or more-celled, with few or many ovules in each cell. Style undivided. Seeds without albumen. Cotyledons not convolute. Trees, shrubs or herbs, with opposite or alternate leaves. Stipules none.

13. Passiflorales.—*Flowers regular or irregular. Stamens perigynous (rarely hypogynous). Pistil syncarpous ; ovary free or adnate,* 1-*celled with parietal placentation, or* 3-*celled with axile placentation.*

Samydaceæ.—Flowers regular or nearly so. Petals and sepals almost conform. Stamens indefinite, or alternating with small scales or glands. Ovary 1-celled, with parietal placentas. Style entire or branched. Seeds albuminous. Trees or shrubs. Leaves alternate. Stipules small or none.

Passifloraceæ.—Flowers regular. Petals persistent with the calyx-lobes and often resembling them. Stamens definite. Ovary stalked, 1-celled, with parietal placentas. Style branched. Seeds albuminous. Climbers, with alternate leaves and stipules.

Datiscaceæ.—Flowers unisexual or polygamous. Perianth segments small. Stamens 4 or indefinite ; anthers dorsifix. Ovary inferior, often open at the apex. Placentas parietal. Styles free, simple or 2-parted. Seeds albuminous. Trees, rarely herbs, with alternate leaves. Stipules none.

14. Umbellales.—*Flowers regular. Ovary inferior,* 2- *or many-rarely* 1-*celled, with a solitary suspended ovule in each cell. Styles distinct or connate at base, on or surrounded by an epigynous disk. Stamens often definite. Albumen copious. Embryo minute or longer and straight.*

Araliaceæ.—Corolla usually valvate in bud. Fruit succulent, not separating. Cells usually more than 2. Trees, shrubs, or rarely herbs, with alternate leaves. Stipules none.

Cornaceæ.—Fruit succulent, 2-celled. Corolla usually valvate in bud. Seeds albuminous. Trees or shrubs, with usually opposite leaves. Stipules none.

Sub-class II. GAMOPETALÆ.

(*Petals united.*)

§ 1.—*Corolla epigynous.*

* *Stamens attached to the corolla.*

15. Caprifoliales.—*Flowers regular or irregular. Stamens as many as corolla-lobes. Ovary inferior, 2- to many-celled, with 1 or numerous ovules in each cell. Albumen present, very rarely absent.*

Caprifoliaceæ.—Anthers free. Ovary 2- to many-celled with 2 to many ovules in each cell. Flowers regular or irregular; stamens usually as many as corolla-lobes. Shrubs or herbs, often climbing, rarely trees, without real stipules. Leaves opposite.

Rubiaceæ.—Flowers usually regular. Stamens isomerous. Anthers free. Ovary 2- to many-celled, with one, 2, or many ovules in each cell. Trees, shrubs, or herbs, with opposite leaves and free or connate stipules.

16. Asterales.—*Flowers regular or irregular; if unisexual, usually collected in involucred heads. Stamens as many as corolla-lobes, rarely fewer. Ovary inferior, 1-celled, 1-ovuled (or if 2-3-celled, with one cell only ovuligerous).*

Compositæ.—Anthers united in a tube round the style. Ovary 1-celled, with a single erect ovule. Seeds without albumen. Flowers in heads, at base surrounded by a scaly receptacle. Calyx limb none or reduced to feathery or simple hairs.

* * *Stamens free from the corolla.*

17. Campanales.—*Flowers usually irregular, rarely unisexual or collected into involucred heads. Stamens as many as corolla-lobes, or fewer. Ovary 2-6-celled, rarely 1-celled, with numerous or rarely a solitary ovule in each cell; style simple; stigma often indusiate.*

Goodenovieæ.—An indusium under the stigma: otherwise as in *Campanulaceæ.* Herbs or shrubs, rarely trees, with alternate or radical leaves.

§ 2. *Corolla hypogynous or perigynous.*

* *Flowers usually regular.*

18. Ericales.—*Corolla hypogynous. Stamens as many or twice as many as corolla-lobes, epipetalous or hypogynous. Ovary 1- to many-celled, with 1 to many ovules in each cell; stigma simple, entire, or lobed. Seeds minute.*

Ericaceæ.—Stamens twice as many as corolla-lobes. Anthers 2-celled, opening in terminal pores, free or connate. Ovary inferior or superior, with as many cells as corolla-lobes. Seeds albuminous. Shrubs or trees, with alternate leaves.

Epacrideæ.—Stamens as many as corolla-lobes and alternate with them, or rarely fewer. Anthers 1-celled. Ovary superior, with 5 or fewer cells. Seeds albuminous.

19. PRIMULALES.—*Corolla regular, hypogynous, rarely epigynous, gamo- rarely poly-petalous. Stamens as many as corolla-lobes and opposite to them; or if more, one series, always opposite them, hypogynous or epipetalous. Ovary* 1*-celled, with free basal placentation.*

Myrsineæ.—Stamens as many as corolla-lobes. Ovary 1-celled, with peltate ovules attached to a free central placenta. Fruit succulent or hard, usually indehiscent. Seeds rarely without albumen. Trees or shrubs, with alternate usually dotted leaves.

20. EBENALES.—*Corolla* 1- *to poly-petalous, hypogynous or epigynous, rarely perigynous. Stamens usually many, more than corolla-lobes, or if equal in number, alternating with them (except in Sapoteæ). Ovary* 2- *to many-celled, with usually few ovules in each cell. Fruit rarely capsular.*

Sapotaceæ.—Corolla-lobes as many, or twice or thrice as many, as calyx-segments. Calyx-lobes imbricate in 2 or more series. Anther-cells often directed outwards. Stamens as many or twice as many as corolla-lobes. Ovary 2- or more-celled, with a solitary ovule in each cell. Fruit succulent or hard, usually indehiscent. Seeds with or without albumen. Trees or shrubs, the juice often milky. Leaves alternate.

Ebenaceæ.—Flowers often dioecious. Corolla-lobes 3 to 5. Calyx simply lobed or toothed. Anther-cells directed inwards. Stamens few or many, indefinite. Ovary superior, 3- or more-celled, with 1 or 2 ovules in each cell. Fruit succulent, usually indehiscent. Seeds albuminous. Trees or shrubs, with alternate leaves; juice not milky.

Styraceæ.—Flowers hermaphrodite. Corolla-lobes as many or twice as many as calyx-lobes. Stamens usually more than twice as many, rarely twice as many as corolla-lobes, or fewer. Ovary (at least the fruit) more or less inferior, 2-5-celled, with 2 or more ovules in each cell. Fruit usually succulent and indehiscent. Seeds albuminous. Trees or shrubs, with alternate leaves.

21. GENTIANALES.—*Corolla mono- or rarely almost poly-petalous, hypogynous. Stamens as many as corolla-lobes, or fewer, always inserted on the corolla and usually included in its tube. Ovary usually syncarpous and* 2*-celled.*

Jasmineæ.—Corolla with 4, 5, or more lobes, rarely 2-petaled, or none. Stamens 2, rarely 4, alternating with the carpels. Ovary 2-celled, with 1 or 2 ovules in each cell. Fruit succulent or capsular. Seeds with or without albumen. Trees or shrubs, often scandent, with opposite or very rarely alternate leaves.

Apocyneæ.—Stamens 5. Anthers more or less connivent round the stigma. Ovary of 2 distinct carpels, the styles connected upwards, or rarely the carpels united from the base. Fruits of 1 or 2 follicles, drupes, or berries. Seeds usually albuminous. Trees, shrubs, or perennial, sometimes climbing, with opposite or rarely scattered leaves; juice often milky.

Asclepiadeæ.—Stamens 5; anthers connate round the stigma, 2- or 4-celled; pollen consolidated in 1 or 2 masses in each cell. Ovary of 2 distinct carpels; the styles united upwards. Follicles solitary or twine. Albumen scanty. Shrubs or herbs, often climbing, with opposite leaves; juice often milky.

22. POLEMONIALES.—*Corolla hypogynous, monopetalous, regular. Stamens as many as corolla-lobes and inserted on the tube; filaments usually exserted. Ovary usually syncarpous,* 1-5*-celled, with* 1, 2, *or rarely many ovules in each cell. Albumen present.*

Borragineæ.—Flowers in cymes or one-sided racemes or spikes. Ovary 2- or 4-celled with a solitary ovule in each cell; or 2-celled with 2 parallel ovules in each cell. Style single, entire, or rarely forked. Fruit a drupe, or dry, and separating into 2 or 4 nuts. Albumen rare or scanty. Trees or shrubs, or hispid herbs, with usually alternate leaves.

Convolvulaceæ.—Corolla-limb folded in the bud. Ovary of 2 to 4 cells or carpels, with 1 or 2 erect ovules in each. Style simple or 2-branched, or 2 distinct styles. Fruit capsular or succulent and indehiscent. Seeds with little or no albumen. Cotyledons much folded (or inconspicuous in *Cuscuta*). Herbs or shrubs, often climbing, rarely trees or leafless parasitic twiners; juice often milky. Leaves alternate.

23. Solanales.—*Corolla monopetalous, hypogynous, regular or oblique. Stamens as many as corolla-lobes, epipetalous, equal or unequal. Ovary syncarpous, 2-celled, with numerous ovules in each cell.*

Solaneæ.—Corolla-lobes folded or rarely imbricate in bud. Ovary 2-celled or spuriously 4-celled (rarely 3- or 4-celled), with several ovules in each cell. Style single. Fruit a berry or a capsule. Seeds albuminous. Embryo usually curved or annular. Herbs or shrubs, rarely small trees, with alternate leaves.

* * *Flowers irregular. Of the stamens usually* 1 *or* 3 *wholly or partially aborted.*

24. Personales.—*Corolla monopetalous, hypogynous, often* 2*-lipped. Stamens fewer than corolla-lobes, rarely as many, unequal, usually* 4 *and didynamous, or* 2. *Ovary* 1-2- *very rarely* 4*-celled, with usually very numerous ovules in each cell. Style simple, stigmas* 1-2. *Fruit usually capsular.*

Bignoniaceæ.—Perfect stamens 4 in pairs, or 2 only. Ovary 2-celled with 2 distinct and sometimes distant placentas on the dissepiment in each cell; ovules usually numerous. Fruit capsular, often very elongated. Seeds often winged. Albumen none. Trees, rarely climbing or erect shrubs, with opposite often compound leaves.

Acanthaceæ.—Perfect stamens 4 in pairs, or 2 only, with or without a pair of rudimentary ones. Ovary 2-celled with 2 or more superposed ovules in each cell. Fruit a capsule opening elastically in 2 valves. Seeds usually supported by hooked or rarely cup-shaped or minute seed-bearers. Albumen none. Herbs or shrubs, rarely climbing, with opposite leaves.

Pedalineæ.—Perfect stamens 4 in pairs, or rarely 2 only. Ovary composed of 2, rarely 3 or 4 carpels, but divided (at least after flowering) into twice as many cells by spurious dissepiments. Ovules 2 or more, or rarely 1 only in each spurious cell (half-carpel). Fruit hard and indehiscent or capsular. Albumen none. Herbs with opposite leaves.

25. Lamiales.—*Corolla usually* 2*-lipped, rarely almost regular or quite regular, hypogynous. Stamens fewer than corolla-lobes, rarely as many, unequal, usually* 4 *and didynamous, or* 2. *Ovary* 2- 4*-celled, with a single or rarely* 2 *ovules in each cell. Style simple. Fruit an indehiscent* 2- 4*-celled drupe or consisting of* 2-4 *nuts.*

Verbenaceæ.—Stamens 2 or 4, in pairs, or rarely equal and isomerous (in teak) with the corolla-lobes; anthers 2-celled. Ovary not at all or scarcely lobed; the style terminal. Micropyle and radicle inferior. Trees, shrubs, or herbs, sometimes scandent. Leaves opposite or rarely alternate.

Labiatæ.—Stamens 2 or 4, in pairs; anthers 2-celled or 1-celled by abortion or by confluence. Ovary deeply lobed; the style nearly basal between the lobes. Micropyle and radicle inferior. Herbs or shrubs, with opposite leaves.

Sub-Class III. MONOCHLAMYDEÆ.

Perianth really or apparently simple, the lobes or segments all calycine or herbaceous, or all petal-like or scarious, or entirely wanting.

26. Chenopodiales.—*Flowers often hermaphrodite. Perianth green or coloured, usually regular; tube short or none; the segments imbricate in the bud. Ovary of* 1 *or rarely several carpels, with one or rarely* 2 *or more basal ovules in each cell. Embryo usually coiled or curved.*

Nyctagineæ.—Lower portion of the perianth persistent and enclosing the ovary and fruit, the upper portion deciduous and withering. Stamens inserted on the torus. Ovary 1-celled with a single ovule and a single style. Trees, shrubs, or herbs, with usually opposite leaves. Stipules none.

Phytolaccaceæ.—Perianth green or petaloid, the tube short or none. Stamens hypogynous or nearly so. Ovary of several free or connate 1-ovuled carpels. Embryo often curved or coiled. Albumen mealy or none.

27. Laurales.—*Flowers usually unisexual. Perianth green or coloured, usually regular. Ovary superior (inferior in Gyrocarpeæ),* 1*-celled, with a solitary ovule; stigma* 1. *Albumen present or none. Embryo straight.*

Myristicaceæ.—Flowers dioecious. Perianth-lobes in a single series, valvate in bud. Stamens united in a central column. Carpel solitary. Embryo very small, at the base of a ruminate albumen. Trees or rarely shrubs, with alternate leaves.

Laurineæ.—Flowers hermaphrodite. Perianth-segments usually in 2 rows. Stamens opposite the perianth-segments; anther-cells opening in deciduous valves. Carpel solitary. Fruit succulent. Albumen none. Radicle superior. Trees or shrubs, with alternate or rarely opposite leaves or (in Cuscuta) a leafless parasitic twiner.

28. Daphnales.—*Flowers usually hermaphrodite. Perianth green or coloured, regular or irregular, often tubular. Ovary* 1*- rarely 2-celled, superior, with usually a solitary pendulous or almost erect ovule in each cell; stigma* 1. *Albumen none, rarely scanty. Embryo straight.*

Elaeagnaceæ.—Flowers hermaphrodite. Perianth 2- or 4-lobed, contracted beyond the otherwise free ovary. Style 1; ovule 1, erect. Albumen fleshy. Trees or shrubs, often scandent, and covered with silvery or rusty scales.

Thymelaeaceæ.—Flowers hermaphrodite. Perianth-lobes imbricate. Stamens as many or twice as many, inserted in the tube. Ovary 1- or 2-celled, with a solitary pendulous ovule in each cell. Style 1 or 2. Albumen none. Trees or shrubs, with a peculiar stringy bark and alternate or opposite leaves.

Proteaceæ.—Flowers hermaphrodite; perianth-segments 4, valvate. Stamens opposite the perianth-segments and inserted on them. Carpel solitary. Albumen none. Radicle inferior. Trees or shrubs, with alternate or rarely opposite leaves.

29. SANTALALES.—*Flowers hermaphrodite or diclinous. Perianth usually conspicuous, coloured, polymorphous and valvate. Ovary* 1- *to many-celled, with* 1 *to many ovules in each cell, the ovules usually reduced to a naked nucleus. Fruit a drupe or berry, usually* 1*-seeded.*

Loranthaceæ.—Flowers hermaphrodite. Perianth often brightly coloured, of 4 to 6 or rarely more valvate segments. Stamens as many as perianth-segments and opposite and adnate to the same. Carpel solitary, with a single erect or suspended ovule. Albumen green, fleshy. Parasitical shrubs.

Santalaceæ.—Flowers hermaphrodite. Perianth wholly or partially superior, the lobes valvate. Stamens opposite the lobes. Ovary 1-celled, with 1 to 5 ovules suspended from a central placenta. Albumen fleshy. Trees, shrubs, or herbs, often parasitic, with alternate or opposite leaves.

30. EUPHORBIALES.—*Flowers unisexual or rarely hermaphrodite. Perianth various or none. Ovary superior,* 2- *to many-celled, with* 1 *to numerous pendulous ovules in each cell. Fruit often capsular, rarely a berry or drupe.*

Euphorbiaceæ.—Flowers unisexual. Perianth calyx-like or often consisting of true corolla and calyx. Ovary of 3, rarely 2 or more than 3, united carpels, with 1 or 2 suspended ovules, and usually separating into cocci. Seeds usually albuminous. Trees, shrubs, or herbs, with alternate or opposite leaves.

31. URTICALES.—*Flowers unisexual or hermaphrodite. Perianth green, usually regular, rarely none. Stamens opposite the perianth-lobes or sepals. Ovary superior,* 1- *or rarely* 2*-celled, with a solitary ovule in each cell; stigmas* 1 *or* 2*; micropyle always superior. Fruit usually an achene or samara. Albumen present or not. Embryo straight.*

Urticaceæ.—Flowers unisexual, the males small and green. Stamens opposite the perianth-segments. Ovary superior, free or connate, with 1 (rarely 2) ovules. Fruit various, 1-seeded. Seeds albuminous. Trees, shrubs, or herbs, with usually alternate leaves. Stipules present.

32. QUERNALES.—*Flowers unisexual, the males in catkins, the females solitary or in spikes. Perianth green, that of the males lobed or reduced to a scale, that of the females minute,* 2-6*-lobed or toothed. Ovary inferior,* 1-6*-celled, with a solitary, erect, or* 1 *or more pendulous ovules in each cell. Fruit* 1*-seeded. Albumen none.*

Juglandeæ.—Perianth of male flowers a scale or bract, that of the females 2-4-toothed. Ovary 1-celled, with a solitary erect ovule. Fruit a drupe, with a 2-valved endocarp. Trees, with pinnate leaves. Stipules present.

Cupuliferæ.—Perianth of male flowers unequally lobed, that of the females 6-lobed. Ovary 2-4-celled. Fruit consisting of 1-3 1-seeded nuts in an involucre or cup. Trees or shrubs, with simple alternate leaves. Stipules present.

33. AMENTALES.—*Flowers unisexual, in catkins, cones, or heads. Perianth none or calyx-like, or consisting of* 1 *or more bristles, bracts, bractlets, or scales. Ovary superior,* 1-2*-celled. Albumen none.*

Amentaceæ.—Flowers monoecious. Ovary inferior, surmounted by a rudimentary toothed perianth-limb, 2- or more-celled. Fruit 1-celled, 1- rarely few-seeded. Albumen none. Seeds naked. Trees, with alternate leaves and with stipules.

Salicineæ.—Flowers dioecious, in catkins. Perianth none or rudimentary. Ovary free, 1-celled; ovules indefinite, basal or parietal. Seeds with a tuft of hair. Trees or shrubs, with alternate leaves.

Casuarineæ.—Flowers monoecious, in spikes. Perianth in male flowers 2-phyllous, in females none. Stamen 1. Ovary 1-celled with 1 or 2 ovules; styles 2. Cones woody, the woody bracts valvately opening. Caryopsis winged. Leafless trees, with jointed branchlets furnished with toothed sheaths like in *Equisetum*.

DIVISION 2. GYMNOSPERMS. Ovules naked, without ovary or stigma. Seeds naked. Cotyledons sometimes several. To this division belong the conifers, Cycads (*mundein*) and Gnetum (*jutnoë*)—

Gnetaceæ.—Stamens in the males, ovules in the females, enclosed in an ovoid or tubular bract. Shrubs, or rarely little trees, usually scandent, with jointed stems and opposite leaves, rarely leafless.

Coniferæ.—Anthers in the males, ovules in the females, inserted on scales, often forming spurious catkins or cones. Trees or shrubs, with a branched not jointed stem and simple often scale-like or needle-shaped leaves.

Cycadeæ.—Anthers numerous on the under surface of scales arranged in a cone; ovules from separate reduced fronds. Small but robust trees, often stemless, the stem not or sparingly branched. Leaves pinnate.

Class II. MONOCOTYLEDONS or ENDOGENS.

Stem, when woody, uniformly consisting of bundles of fibres irregularly imbedded in cellular tissue with a firmly adherent bark on the outside. Embryo with one undivided cotyledon, the young stem being developed from a sheath-like cavity on one side. Floral parts usually 3-merous, the calyx and corolla, if present, usually almost conform in structure, forming often a 6-parted perianth. Leaves usually (except in *Scitamineæ*, *Dioscorideæ*, *Smilax*, and some *Aroideæ*) simply parallel-veined. Of Burmese trees belong to this class the palms, screw-pines, *Dracaena*, and bamboos; some people also call the plantain a tree.

* *Ovary inferior. Perianth usually distinct, in 2 series, coloured.*

1. Amomales.—*Flowers usually hermaphrodite and very irregular. Perianth of 5-6 segments. Stamens 6, 1 or 5 anther-bearing, the rest petaloid or abortive, or all 6 fertile. Ovary usually 3-celled. Fruit a berry or capsule.*

Musaceæ.—Flowers irregular. Perianth of 6 segments, petaloid, in 2 distinct rows, the posterior inner segment often free and labellum-like. Stamens 6, or usually only 5; anthers 2-celled. Seeds albuminous. Tall

herbs with a spurious stem formed by the leaf-sheaths, rarely trees with woody trunk with large leaves transversely veined from the mid-rib.

* * *Ovary superior. Ovary syncarpous (very rarely apocarpous in a few palms).*

2. Palmales.—*Flowers usually unisexual on a branched or simple spadix. Perianth of* 6 *coriaceous segments in two rows. Stamens* 6, *rarely more or fewer, hypogynous or perigynous. Ovary* 3- *rarely* 1-*celled, or of* 3 *separate carpels, with* 1 *or rarely* 2 *ovules in each cell; styles short, free, or connate. Fruit various, never capsular,* 1-3-*seeded. Seeds large. Embryo minute, sunk in a pit of the horny or fleshy albumen.*

Palmæ.—Flowers more or less perfect, with or without bracts, seated on a branched rarely simple spadix protected by 1 or more spathes. Perianth of 6 segments, often very rigid or coriaceous; the inner segments often corolla-like, imbricate or valvate in bud. Ovary usually of 3 carpels, either completely syncarpous, or more or less apocarpous. Ovules solitary, or by 2 in each carpel, usually erect. Albumen horny. Simply stemmed or stemless trees, often very lofty, or climbers; the leaves usually pinnate or flabellate, plaited, parallel-veined.

3. Arales.—*Flowers hermaphrodite or unisexual, arranged in a spadix or spike, with or without a spathe, or sunk in pits of a minute scale-like frond. Perianth of distinct segments, white or green or of minute scales, or none. Fruit a drupe or berry with* 1 *to many seeds. Albumen present.*

Pandanaceæ.—Flowers usually naked, numerous, the males in branched, the females often in simple, spadices furnished with many spathes at the base. Ovary 1-celled, with a solitary or rarely several erect or numerous ovules along parietal placentas. Albumen fleshy. Trees or shrubs, sometimes climbing, with linear often spiny-bordered leaves arranged screw-like or distichously, or rarely (in *Cyclantheæ*) the leaves flabellate. Drupes forming a syncarp.

4. Liliales.—*Flowers hermaphrodite, very rarely unisexual, inflorescence various. Perianth of* 6 (*very rarely* 4), *almost conform segments, or monopetalous and* 6-*lobed, regular, usually all coloured and petal-like. Embryo immersed in a copious albumen.*

Liliaceæ—Perianth of 6 segments, all the segments petaloid, regular. Stamens 6; anthers turned inwards. Styles consolidated. Ovary 3-celled. Albumen fleshy. Rarely trees or shrubs, usually tuberous or simply-rooted herbs with parallel-veined leaves.

5. Glumales.—*Flowers in the axils of scales arranged in spikelets. Perianth none, or of minute scales, hairs, or bristles. Stamens* 1-3, *rarely* 6 *or more. Ovary* 1-*celled, with a single ovule. Fruit a caryopsis. Albumen fleshy or mealy. Embryo immersed or not. Grasses or grass-like herbs, rarely arboreous.*

Gramineæ.—Perianth none, or of 1-3 minute scales. Anthers versatile. Embryo at the side of the base of the mealy albumen. Annual or perennial grasses, rarely (in bamboos) soboliferous trees or shrubs, with parallel-nerved leaves. Culms jointed and nodded. Sheaths of the leaves usually split to the base. Each flower usually in a secondary bract (palea) within the glume.

B. SPORE-BEARING PLANTS or CRYPTOGAMS.

Plants bearing no real flowers,—that is, neither stamens, nor pistils, nor true seeds; the fructification consisting of minute, often microscopic cells, called *spores*, variously enclosed in *spore-cases*. A few tree-ferns are the only trees in this class.

1. FILICALES.—*Plants with both cellular and vascular tissue. Antheridia, or archegonia, or both, formed on a prothallus that is developed from the spore on its germination.*

Filices.—Fructification of very minute capsules (sporangia), full of microscopic spores situated on the under surface or along the margins of the frond, or on separate branches of the frond; rarely of larger capsules which are more or less confluent on the under surface of the frond or collected in simple or branched spikes. Terrestrial, very rarely marsh-plants, sometimes furnished with a short trunk, or trees. Vernation usually circinnate.

A. PHANEROGAMIC PLANTS.

I. DICOTYLEDONS.

RANUNCULACEÆ.

Flowers hermaphrodite, regular, or sometimes irregular and spurred. Sepals 3 to many (usually 5), often petaloid, deciduous, rarely altogether wanting. Stamens indefinite ; anthers adnate, opening by lateral slits ; filaments subulate. Carpels 1-seeded, or many-seeded follicles, numerous or few, free, on a torus which sometimes elongates. Arillus none. Embryo small, in a fleshy albumen. Herbs or shrubs, with opposite or alternate leaves. Stipules none.

Many of the herbaceous species possess acrid, caustic, and poisonous properties. A sort of bikh or bish, a virulent poison, is obtained from a species of *Aconitum* in the hills north of Ava. About 11 or 12 species of *Ranunculaceæ* are recorded from Burma.

No petals ; leaves without tendrils . . . . . *Clematis.*
Petals terete ; the petiole tendril-bearing . . . . . *Naravelia.*

CLEMATIS, L.

No petals, or if any, these gradually pass into stamens. Leaves without tendrils. Woody climbers, all inhabiting remote hilly parts of Burma, and therefore rarely seen by the forester. The stems while fresh are used often for ropes and are very strong.

* *Achenes simply beaked, without feathery tail; flowers large.* *C. cadmia.*
** *Achenes terminating in a feathery tail.*
× Leaves simple ; all parts glabrous . . . . *C. smilacifolia.*
×× Leaves compound.
○ Anthers terminating in a subulate appendage . *C. hedysarifolia.*
○○ Anthers blunt, retuse or acute.
† Filaments glabrous.
Leaflets serrate, glabrous, shining . . . . . *C. Gouriana.*
Leaflets entire, tomentose . . . . . *C. subumbellata.*
Leaflets entire, glabrous . . . . . *C. Hothue.*
†† Filaments hairy (at least towards the base).
Leaflets shining, glabrous ; flowers small . . . *C. acuminata.*
Leaflets tomentose ; flowers large . . . . . *C. Buchandniana.*

* *Achenes simply beaked, without plumose tail.*

LIBRARY

1. **C. cadmia,** Ham. ; H.f. Ind. Fl. i. 2.—A climber with bi and tern natisect leaves ; leaflets ovate, entire, acuminate to blunt, usually glabrous, about 1-2 in. long ; flowers rather large, bluish-white, solitary, on long axillary peduncles 2-bracted at about their middle ; stamens much shorter than the sepals ; the filaments very short, flat, glabrous ; achenes large, compressed, somewhat silky, terminating in a short straight beak.

Hab.—Ava.

* * *Achenes terminating in a plumose tail.*

2. **C. smilacifolia,** Wall ; H.f. Ind. Fl. i. 3.—A woody climber with furrowed branches ; leaves large, 5-10 in. long, simple, broadly ovate, acuminate, usually cordate at base, glabrous, the upper ones gradually smaller ; flowers rather large, lilac, in loose elongate panicles ; sepals 4 or 5, oblong, acute, spreading, shortly tomentose outside ; stamens gradually smaller and narrower towards the centre, the outermost shorter than the sepals ; filaments long, broadly linear, glabrous ; anthers blunt ; achenes obliquely ovate, compressed, somewhat hairy, soon glabrescent.

Hab.—Ava ; Tenasserim.

3. **C. hedysarifolia,** DC. ; H.f. Ind. Fl. i. 4.—A large glabrous woody climber with furrowed branches ; leaves ternati- or pinnatisect ; leaflets ovate, acuminate, net-veined, almost coriaceous, coarsely toothed or entire ; flowers rather small, in loose compound panicles ; sepals 4, oval, mucronate, densely tomentose outside ; filaments flattened, glabrous, anthers terminated by a subulate appendage ; achenes obliquely oblong, compressed, somewhat pubescent.

Hab.—Pegu (?).

4. **C. Gouriana,** Roxb. ; H.f. Ind. Fl. i. 4.—A large climber with furrowed branches and pinnatisect or twice ternate leaves ; leaflets ovate or oblong-lanceolate, usually irregularly toothed, but often also quite entire, acuminate, glabrous, or more or less downy beneath ; flowers rather small, white, in compound panicles ; sepals revolute, oval, tomentose outside ; anthers oblong, blunt ; filaments flattened, glabrous ; achenes small, tawny pilose.

Hab.—Ava ; Tenasserim.

5. **C. subumbellata,** Kz.—A woody climber with furrowed branches, all parts densely tomentose ; leaves pinnatisect ; leaflets on short petiolules, ovate, mucronate, 1½-2 in. long, entire, coriaceous, especially beneath densely greyish or tawny tomentose ; flowers small, forming a spurious umbel on the extreme branchings

of the tomentose short rigid panicle; sepals 4, ovate, blunt, densely tomentose; filaments short, glabrous; anthers blunt.

HAB.—Karennee country, Martaban.

6. **C. Hothae,** Kz.—A scandent shrub, all parts glabrous; leaves ternatisect, on a 1-2½ in. long petiole; leaflets ovate-oblong to oblong, on curved petiolules ⅓-½ in. long, rounded at the base, acuminate, quite entire, thin coriaceous, 1½-3 in. long, glabrous; flowers rather small, on slightly pubescent, slender, ½-¾ in. long pedicels, forming brachiate axillary panicles collected into larger ones at the end of the branchlets; sepals nearly ½ an in. long, greyish tomentose on the borders, acute; filaments perfectly glabrous, the anthers blunt; carpels densely white-pilose.

HAB.—In the hills east of the Kakhyen hills, Ava.—Fl. Aug.

7. **C. acuminata,** DC.; H.f. Ind. Fl. i. 5.—A glabrous large woody climber with furrowed branches and ternatisect (or rarely 1-foliolate) leaves; leaflets slightly coriaceous, 3-4 in. long, ovate to ovate-lanceolate, acuminate, rounded at base, crenate-toothed, net-veined, shining above; flowers of the Burmese plant larger than those of the normal form and remarkably like those of *C. connata* blue, in loose slender panicles; sepals 4, erect, oblong, rather acute, glabrous, somewhat puberulous on the margins; filaments long, pilose; anthers short, blunt; achenes ovate, rather small, shortly pilose.

HAB.—In the damp hill-forests of Martaban, east of Tounghoo, at 3,000 to 4,000 ft. elevation; Ava, Kakhyen hills.—Fr.—March.

8. **C. Buchananiana,** DC.; var. rugosa, H.f. & Th. Ind. Fl. i. 6.—A large greyish tomentose woody climber, with pinnatisect densely tomentose leaves; leaflets 2 to 3 in. long, broadly ovate, cordate at base, shortly acuminate, lobed and coarsely toothed, the nerves prominent and strong; flowers rather large, cream-coloured, in lax panicles; sepals linear-oblong, almost blunt, densely tomentose outside; filaments long, silky pilose; anthers blunt; achenes ovate, pubescent.

HAB.—Martaban hills.

NARAVELIA, DC.

Petals terete, abruptly separated from the stamens. Leaves 2-foliolate, the petiole tendril-bearing.—Woody climbers of the tropical plains.

Leaves tomentose or pubescent beneath	*N. zeylanica.*
All parts quite glabrous	*N. laurifolia.*

1. **N. Zeylanica,** DC., H.f. Ind. Fl. i. 7.—*Sal-jo-gil.*—A woody climber; leaflets more or less ovate, shortly acuminate, usually densely pubescent or tomentose beneath; flowers rather small, yellowish, in lax panicles usually longer than the leaves; petals linear-spathulate; achenes spirally twisted with a long pilose tail.

Hab.—Pegu, frequent in the mixed forests, especially in the lower ones, along choungs and also in hedges around villages, &c.; also Ava, and probably all over the country.—Fl. R. S.; Fr. C. S.—l.

2. **N. laurifolia,** Wall; H.f. Ind. Fl. i. 7.—A glabrous large woody evergreen climber; leaflets oblong, acuminate, coriaceous; flowers cream-coloured, rather small, in poor panicles, shorter than the leaves; petals elongate, club-shaped; achenes spirally twisted with a long pilose tail.

Hab.—Martaban down to Tenasserim, in the tropical forests not unfrequent. Fl. Feby.—March.—s.—SS.=Metam.

DILLENIACEÆ.

Sepals usually 5 (rarely 4 or 6), persistent, imbricate in aestivation. Petals 5 or rarely fewer, deciduous. Stamens indefinite, rarely definite, usually free, rarely variously connate at base; anthers adnate, dehiscing by lateral slits or by terminal pores. Gynoecium free, consisting of 1 or many distinct or coherent carpels; ovules solitary or many in each carpel; styles distinct, terminated by a simple stigma. Ripe carpels either capsule-like and opening along the edge at the top, or succulent and indehiscent, rarely crustaceous. Seeds solitary or several, with an arillus. Embryo very small, at the base of a fleshy albumen.

Most species of this family possess astringent properties. The very scabrous leaves of some are used for polishing. The fruits of Dillenia, enveloped in the enlarged fleshy calyx, are eaten raw or in curries, etc. Dillenia alone contains trees of some importance to the forester, the others are climbers or shrubs. About 11 species are known to grow in Burma.

* *Filaments more or less dilated at the apex. Climbers or shrubs.*
Carpels solitary. Ovules 2-3, basilar . . . . . *Delima.*
Carpels 3-5. Ovules many, in 2 series . . . . . *Tetracera.*
* * *Filaments throughout their length equal. Trees.*
Arillus wanting or pulpy . . . . . *Dillenia.*

DILLENIA, L.

Sepals and petals 5, spreading. Stamens almost free; anthers opening by slits. Carpels 5-20, adhering to the axis and united

only by the ventral margin; styles as many, stellately reflexed; ovules many, in 2 rows. Fruit indehiscent, almost berry-like, 5-many-celled, enclosed by the enlarged fleshy calyx. Seeds imbedded in pulp or pulpless, without arillus.—Trees, with large parallel-nerved leaves. Flowers showy, white or yellow, solitary, or in fascicles or lax panicles.

* *Seeds along the margins hairy. Flowers very large, white.* *D. Indica.*
** *Seeds smooth. Flowers yellow.*
△ Calyx tomentose or pubescent.
○ Petals about 2 in. long; flowers solitary.
Peduncles very long, straight; styles 12; petioles long . . *D. pulcherrima.*
Peduncles short and thick, nodding; styles 10; petioles long . *D. aurea.*
Peduncles very long and slender; styles 6; petioles only 1-2 lin. long . . . . . *D. pilosa.*
○ ○ Petals less than 1 in. long; flowers fascicled.
Calyx and peduncles densely tomentose; styles 5-7 . . . *D. parviflora.*
△ △ Calyx and peduncles perfectly glabrous or pruinous; flowers fascicled.
Peduncles bracted . . . . . *D. scabrella.*
Peduncles without bracts . . . . . *D. pentagyna.*

* *Seeds along the margins hairy. Flowers very large, white.*

1. **D. Indica,** L.; H. f. Ind. Fl. i. 36; Brand. For. Fl. 1.—(*D. speciosa*, Thbg.; Bedd. Sylv. Madr. t. 103).—*Tha-pyoo.*—An evergreen tree, (30—50 + 15—20 + 3—5), the young shoots silkhairy; bark reddish, about 2 lin. thick, with papery smooth skin; cut reddish; leaves 8 to 10 in. long or longer, oblong to oblong-lanceolate, on a slender pubescent petiole 1-1½ in. long, acute, sharply serrate, almost chartaceous, slightly appressed-pubescent on the nerves beneath, glabrescent; flowers solitary, very large, about 5 to 6 in. in diameter, pure white, on 2 to 3 in. long pubescent peduncles, arising solitary from the axils of the upper leaves; sepals rotundate; petals obovate-oblong; inner series of stamens larger and longer than the outer ones; stigmas about 20, linear, recurved, spreading; carpels as many, surrounded by the enlarged fleshy calyx of the size of a large apple.

Hab.—Moister upper-mixed forests along choungs, especially from Martaban down to Tenasserim, rather rare in the Pegu-Yomah, up to 1,000 feet elevation. Fl. R. S.; Fr. C. S.—s.—SS. = SiS., Metam.

Remarks.—Wood hard, brown, used occasionally for house-building. W. = □' = 41 pd.

* * *Seeds smooth. Flowers yellow.*

2. **D. pulcherrima,** Kz.; H. f. Ind. Fl. i. 37.—*Byoo.*—A tree (30—40 + 5—10 + 5—9), shedding leaves during HS., the shoots appressed silkhairy; bark smoothish, lamellate, ash-grey or whitish; leaves elliptical to broadly obovate, on an in. long or somewhat longer petiole, usually rounded at base, almost blunt, coarsely repand-

toothed, slightly pubescent while young, soon turning quite glabrous and glossy, coriaceous; flowers about 4 in. in diameter or larger, yellow, solitary, on a 1½ to 2 in. long, straight, greyish, pubescent peduncle arising laterally below the leaf-buds at the end of the former year's branchlets; petals about 2 in. long, obovate, narrowed in a broad base; sepals ciliate, appressed, silky, pubescent; styles and carpels about 12; ripe carpels enclosed in the enlarged fleshy globular calyx of an orange-yellow colour, about 1½ in. in diameter.

Hab.—In the open forests, chiefly in the Eng and low forests, frequent in Prome, but more common in Pegu and Martaban, up to 1,000 ft. elevation; in the Sittang zone occurring also in low savannah-forests on shallow alluvium, probably resting on gravelly or laterite strata. Fl. H. S.; Fr. Begin of R. S.—l.—S S. = Ca S. Lat. Arg.

Remarks.—Wood hard and strong, used for rice-mills. W. $\square^1 = 69$ pd. The trunk remains usually low and crooked.

3. **D. aurea,** Sm.; H. f. Ind. Fl. i. 37; Brand. For. Fl. 2.—A tree (50—60 + 10—25 + 5—6), shedding leaves during HS., the young shoots appressed-pubescent; leaves obovate to elliptically obovate, on a strong petiole, 5 to 6 lin. long, blunt or nearly so, somewhat decurrent at the cuneate base; while young pubescent, especially along the nerves beneath, soon quite glabrous and glossy, coriaceous; flowers solitary, about 3 to 4 in. in diameter, yellow, on short 5-8 lin. long, thick, slightly pubescent and nodding peduncles arising from the ends of the previous year's branches; petals 2 in. long, almost rotundate or elliptical; sepals pubescent; stigmas 10; carpels enclosed in the fleshy globular yellow or orange-coloured pubescent calyx of 1½ to 2 in. in diameter.

Hab.—Drier hill forests, frequent in Martaban and Tenasserim, at elevations from 2,000 to 3,000 feet.—Fl. H. S.; Fr. Beginning of R. S.—l.—SS. = Metam.

4. **D. pilosa,** Roxb.—A tree (80—90 + 40—50 + 8—9), shedding leaves during HS., the shoots appressed silkhairy; bark thin, smooth, greyish; leaves about a foot long, oblong-lanceolate, cuneately narrowed towards the rounded base; while young, sessile with a leafy decurrent base and almost stemclasping; when full grown on a very thick petiole about 2 to 3 lin. long, slightly repand-toothed, acute or almost blunt, glabrous and glossy above, pilose along the nerves beneath or glabrescent; flowers about 2½ in. in diameter, yellow, solitary, on a slender, pubescent peduncle one in. long, arising from the very short wart-like branchlets along the older branches; sepals silky, pubescent, ciliate; petals oblong, about 1½ in. long; inner series of stamens twice as long as the outer ones; styles and carpels 6; ripe carpels enclosed in the fleshy orange-coloured or yellow globular calyx of about one in. in diameter.

Hab.—Not unfrequent in the upper mixed forests of the Andaman Islands.—Fl. H. S.; Fr. Begin of R. S.—l.—SS.=SiS.

Remarks.—Wood uniformly greyish, rather close-grained, rather coarsely fibrous and heavy. May be useful for house-building.

5. **D. parviflora,** Griff.; H.f. Ind. Fl. i. 38.—*Lingyow.*—A tree (60—70 + 30—35 + 6—8), leafless during HS., all parts more or less pubescent; leaves obovate-oblong to elliptical, on slender petioles about 1½ in. long pubescent, shortly acuminate or acute, repand-toothed, chartaceous, scabrous above, shortly and densely pubescent beneath, about 8-10 in. long; flowers rather small, yellow, nearly 2 in. in diameter, on 1 to 2 in. long, shortly pubescent, 1- or 2-bracted peduncles, arising by 2 to 4 from very short wart-like branchlets along the branches; sepals densely pubescent; petals oblong, about 8 to 10 lin. long, on long slender claws; styles 5-7, as long as the carpels; fruits globular, orange-coloured, shortly pubescent, the size of a walnut.

Hab.—In the mixed forests, especially the upper ones; frequent in Pegu, Martaban, and Tenasserim, up to 2,000 ft. elevation.—Fl. H. S.; Fr. Beginning of R. S.—l.—SS.=All. SiS. Metam.

6. **D. scabrella,** Roxb.; H.f. Ind. Fl. i. 38.—A tree (40—50 + 10—25 + 3—4), shedding leaves in the HS., all softer parts shortly pubescent; bark grey, rather smooth; leaves oblong to obovate-oblong, up to a foot long, on a slender about one in. long pubescent petiole, acute on both ends, slightly repand-toothed, scabrous above, densely roughish pubescent beneath; flowers about 1½ in. across, yellow, on 1 to 2 in. long, glabrous 2- to 3-bracted peduncles, arising usually by 3 to 4 or rarely more from the wart-like reduced branchlets along the branches; sepals about 1½ to ¾ in. long, quite glabrous; petals obovate, nearly one in. long, narrowed at base; inner series of stamens twice as long as the outer ones; styles and carpels 5-7; fruits globular, orange-coloured, smooth, the size of a bullet.

Hab.—Chittagong.—Fl. H. S.; Fr. Begin of R. S.

Remarks.—Wood uniformly brown, close-grained, rather heavy. A good wood, takes fine polish.

7. **D. pentagyna,** Roxb.; H.f. Ind. Fl. i. 38.—Bedd. Sylv. Madr. t. 104; Brand. For. Fl. 20.—*Zeng-byon*—A tree (60—70 + 25—35 + 6—8), leafless during HS., the shoots appressed silkhairy; bark rather thick, greyish, irregularly breaking up into small pieces; leaves of the young trees up to 4 ft. long and broadly decurrent on the short petioles, the full-grown ones usually 2 ft. long, on a very thick petiole 2½ to 3 in. long, obovate-oblong to obovate lanceolate, narrowed at base, acute or almost blunt, repand-toothed, harshly coriaceous, glabrous or slightly appressed, pubescent along the nerves beneath; flowers about 1½ in. across, yellow,

on smooth, somewhat pruinous, 2 to 1 in. long, naked peduncles arising in clusters of 3 to 9 from the reduced wart-like branchlets along the branches ; sepals about 5 lin. long, smooth ; petals obovate, narrowed towards the base, about 8 lin. long ; carpels and styles 5 ; fruits globular, the size of a cherry, smooth, orange-yellow.

Hab.—Mixed forests, especially the upper ones ; frequent from Pegu and Martaban down to Tenasserim, up to 2,000 ft. elevation.—Fl. H. S.; Fr. Begin of R. S.—l.—SS.= ∞ SiS.

Remarks.—Wood rather heavy, fibrous, but close-grained and strong, greyish-brown, striate. Used for house-posts in house-building. W = $\frac{\square^{l} = 48}{198}$ pd.

DELIMA, L.

Sepals 5. Petals 2 to 5. Filaments dilated at the upper end ; outer cells much diverging. Carpel solitary, 2-3-ovuled, almost globose, narrowed in a subulate style. Ripe carpels follicle-like, coriaceous. Seed solitary, with a cup-shaped toothed arillus.—Climbers, with harsh leaves and small panicled flowers.

1. **D. sarmentosa,** L. ; H.f. Ind. Fl. i. 31.—An evergreen, large, woody climber, with rough red-brown branches ; leaves varying from obovate to oblong-lanceolate, blunt or acute, 3 to 4 in. long, crenate-serrate, very scabrous from scattered minute appressed stiff hairs ; flowers small, white, in large axillary panicles at the end of the branches.

Hab.—Frequent in the mixed forests all over Burma ; from Chittagong and Pegu down to the Andamans ; also Ava.—Fl. R. S.—s : l.—SS. = ∞ *Si S.*

TETRACERA, L.

Sepals 4-6. Petals as many or sometimes fewer. Filaments dilated at apex ; anther-cells distinct or more or less diverging. Carpels 3-5, rarely fewer, many-ovuled, the ovules in rows. Ripe carpels follicle-like, coriaceous, 1-5-seeded. Arillus lacerate.—Climbers, with usually harsh leaves and small white panicled flowers.

1. **T. Assa,** DC. ; H.f. Ind. Fl. i. 31.—An evergreen shrubby climber, the young parts usually stiff-hairy ; leaves oblong, acute at both ends, serrate-toothed, 3 to 4 in. long, glabrous above, beneath, especially along the nerves, appressed-pilose ; flowers rather small, white, in small poor panicles ; sepals glabrous, ciliate ; follicles 3-5-seeded ; the arillus orange-red.

Hab.—Chittagong.

There is another new species of this genus (*T. hygrophila*) which, grows abundantly in the swamp forests between the Irrawaddi and the Lhein river, but the flowers or fruits have not yet been found.

MAGNOLIACEÆ.

Sepals and petals very deciduous, arranged in whorls of 3, hypogynous. Stamens indefinite, hypogynous; the filaments free or connate; anthers basifix, the cells adnate, bursting longitudinally. Carpels indefinite, free, or partly cohering in one whorl or in several on an elongate torus; styles stigmatic on the inner face; ovules 2 or more, or those of the ventral suture anatropous or amphitropous. Fruit composed of berry-or follicle-like, or rarely of woody indehiscent carpels, sometimes arranged in a cone. Seeds solitary or few, sometimes suspended from a long funicle; the testa single and crustaceous, or double, the outer fleshy. Albumen granular, fleshy and oily. Embryo minute.—Trees or shrubs, sometimes aromatic, with alternate simple leaves, with or without stipules. Flowers usually large, solitary, or clustered, axillary or terminal.

The species are rich in a bitter, aromatic, tonic principle, chiefly present in the bark of the root and stem. The following are the only species hitherto known from Burma; they are scarce in the forests, and, therefore, of comparatively little importance to the forester.

* *Stipules none. Perianth double. Carpels in a single row* . . . . . *Illicium.*

** *Stipules conspicuous, convolute, and sheathing the young foliage, deciduous.*

○ Ovary sessile.

Carpels of fruit indehiscent, deciduous . . . . . *Talauma.*

Carpels of fruit dehiscing dorsally. Ovules 2 . . . . *Magnolia.*

Fruit-carpels dehiscing dorsally. Ovules 6 or more . . . *Manglietia.*

○○ Ovary stalked . . . . . *Michelia.*

ILLICIUM, L.

Sepals 3-6. Petals 9 or more, in 3 or more series. Stamens indefinite; filaments thick; anthers adnate, introrse. Ovaries indefinite, in a single whorl, 1-ovuled; style subulate, recurved. Follicles stellately spreading, hard, compressed. Seeds compressed. Albumen fleshy.—Evergreen aromatic trees or shrubs, with simple pellucid-dotted leaves and small solitary or fascicled flowers.

1. **I. majus,** H. f. & Th. Ind. Fl. i. 40.—A shrub, 30 ft. high; leaves obovate-oblong or lanceolate, 4-6 in. long, on a 1 in. long petiole, sharply acuminate, coriaceous, glabrous, shining above; flowers pink, on a 1-3 in. long pedicel, solitary or fascicled, almost terminal; "perianth segments" about 16; sepals and petals orbicular, ciliate, the inner petals broad-oval; filaments short, broader than the oblong anthers. (From Hooker's Indian Flora.)

Hab.—Tenasserim, Thoungyeen range, at 5,500 ft. elevation.

TALAUMA, Juss.

Sepals 3. Petals 6 or more, in 2 or more rows. Stamens indefinite, in many series; anthers linear, introrse. Ovaries sessile, indefinite, in spikes or heads, 2-ovuled; stigmas decurrent. Carpels woody, separating from the woody axis at the ventral suture. Seeds suspended from a long funicle, the outer testa fleshy. Albumen oily.—Trees or shrubs, with simple leaves and convolutely stipuled leaf-buds. Flowers large, terminal.

Leaves glabrous; fruits 4 to 6 in. long . . . . . *T. Rabaniana.*
Leaves usually pilose or downy beneath; fruits 2 in. long . . *T. Candollei.*

1. **T. Rabaniana,** H. f. & Th. Ind. Fl. i. 40.—An evergreen large tree; leaves lanceolate, on an in. long petiole, 8-12 in. long, coriaceous, glabrous; flowers very large, solitary, terminal; fruits large, 4-6 in. long, oval; carpels elongate, irregularly obovate, obtusely beaked, 1½ in. long by 1 broad.

Hab.—Tenasserim, Mergui.

2. **T. Candollei,** Bl. (*T. mutabilis,* Bl.; H. f. Ind. Fl. i. 40).—An evergreen large shrub or tree, with brown branches; leaves oval or lanceolate, on a 1-2 in. long petiole, acute at base, 6-12 in. long, acuminate, coriaceous, glossy above; flowers large, white, solitary, terminal; sepals 3, broadly oval, 1-2 in. long; petals 6, nearly equal, obovate; stamens more than 3 times shorter than the petals; carpels 9-12; fruits small, 2 in. long; ripe carpels tubercled, shortly recurved-mucronate.

Hab.—Tenasserim, from Moulmein southwards.

MAGNOLIA, L.

Sepals 3. Petals 6-12, in 2 to 4 whorls. Anthers linear. Carpels sessile, many, oblong-spicate, 2-ovuled. Ripe carpels coriaceous, persistent and opening dorsally by a longitudinal slit. Seeds suspended from a filiform funicle, the outer testa fleshy. Albumen oily.—Trees, with simple leaves and convolutely stipuled leaf-buds. Flowers large, terminal.

1. **M. sphenocarpa,** Roxb.; H. f. Ind. Fl. i. 41.—An evergreen middling-sized tree, the young shoots almost greyish tomentose; leaves oblong, on a rather long petiole, narrowed towards the base, blunt or nearly so, coriaceous, glabrous above, beneath minutely puberulous and glabrescent, the nerves very strong and prominent; flowers large, white, fragrant, solitary, on strong terminal greyish tomentose peduncles; petals oval, waved, fleshy; carpels densely imbricate on a cylindrical 8 to 12 in. long conical axis, tubercled, terminating in a wrinkled compressed beak of more than an in. in length.

Hab.—Chittagong; Pegu.—Fl. Apr.-May; Fr. C.S.

MANGLIETIA, Bl.

Petals 6 or more, in 2 or more rows. Anthers linear. Carpels sessile, many, forming an oval or oblong cone, 6- or more-ovuled. Ripe carpels almost woody, persistent, free, dehiscing dorsally by a longitudinal slit. Seeds suspended from a filiform funicle, the outer testa fleshy. Albumen oily.—Trees, with simple leaves and large terminal flowers.

1. **M. insignis,** Bl.; H. f. Ind. Fl. i. 42.—An evergreen large tree, the leaf-buds brownish villous; leaves lanceolate to oblong-lanceolate, petioled, acute or acuminate, 4-8 in. long, glabrous, glossy above; flowers large, fragrant, pale rose-coloured or white, solitary, on a short and thick terminal peduncle; sepals oblong, blunt, 3 in. long, reddish; petals 9, the inner ones gradually smaller; carpels purple, 3-6-seeded, cohering into an oblong 3-4 in. long almost solid fruit-cone.

Hab.—Pegu.

MICHELIA, L.

Sepals and petals usually conform, 9 or more, imbricate in 3 or more rows. Anthers linear. Carpels stalked, numerous, in spikes, with 8 or more ovules in each. Ripe carpels laxly spiked on the elongate torus, coriaceous, persistent, dehiscing dorsally by a longitudinal slit. Seeds suspended from a filiform funicle, the outer testa fleshy. Albumen oily.—Trees, with simple leaves and rather large solitary axillary flowers.

1. **M. champaca,** L.; H. f. Ind. Fl. i. 42; Bedd. Sylv. Madr. 6; Brand. For. Fl. 3. t. 1.—*Sagah.*—An evergreen tree (30 + 8 + 2½), the young shoots appressed greyish or tawny pubescent; leaves ovate-lanceolate, acute at base, long petioled, 8-10 in. long, acuminate, while young somewhat downy beneath, glossy above; flowers yellow or orange-coloured, fragrant, on a very short, thick, axillary peduncle; sepals and petals 15—20, 1½ to 2 in. long, the outer ones cuneate-oblong, somewhat acute, the inner ones linear-oblong, acute; ripe carpels almost sessile, forming a lax 2 to 4 in. long curved spike.

Hab.—Evergreen tropical forests; rare in Martaban; also Tenasserim.—Fl. H. and R.S.; Fr. C.S.—s.—SS. = Metam.

Remarks.—Wood rather heavy, the sapwood narrow, greyish, coarsely fibrous, the heartwood blackish-brown, striate, close-grained, takes a fine polish.

ANONACEÆ.

Flower 1- rarely 2-sexual. Sepals 3, free or connate, usually valvate in bud. Petals 6, hypogynous, in two rows, or the inner series wanting. Stamens numerous, rarely definite, hypogynous,

closely packed on the torus; filaments short or wanting; anthers adnate, the cells extrorse or almost lateral, the connective often produced. Ovaries several or rarely solitary, free (in *Anona* connate); styles short or none; ovules 1 or more in each cell. Ripe carpels 1 or more on the torus, sessile or stalked, 1- or more-seeded, usually berry-like and indehiscent. Seeds glossy, crustaceous or coriaceous. Albumen dense, ruminate, often divided almost to the axis into horizontal plates. Embryo small or minute, the cotyledons diverging.—Trees or shrubs, often scandent, with alternate simple and entire leaves. Stipules none.

An order comprising numerous Burmese species, all woody, but of comparatively little importance to the forester, the timber of most of the trees being of inferior quality. The seeds of some species contain a highly acrid principle fatal to insects, on which account natives use them powdered for occasionally washing their hair. Several produce edible and delicious fruits.

* *Petals in 2 series, one or both imbricate in the bud. Stamens many, closely packed, the anther-cells concealed.*

Flowers 1- or 2-sexual; ovules many, rarely few or solitary . . *Uvaria.*

* * *Petals valvate or open in bud, spreading in flower, flat or concave at the base only, the inner ones conform or wanting. Stamens many, closely packed, the anther-cells concealed by the overlapping connectives. Ovaries indefinite.*

○ Petals connivent at the concave base and covering the stamens and ovaries.

Ovaries 1—3, many-ovuled; peduncles not hooked; trees . . *Cyathocalyx.*

Ovaries many, 2-ovuled; peduncles usually hooked, mostly scandent shrubs . . . . . *Artabotrys.*

○ ○ Petals flat, spreading from the base.

× Ripe carpels berry-like, indehiscent.

Ovules many, in two rows. Petals lanceolate. Trees . . . *Cananga.*

Ovules 2—6, in a single row along the ventral suture. Shrubs . *Unona.*

Ovules 1 or 2, basal or nearly so. Trees or shrubs. . . . *Polyalthia.*

× × Ripe carpels follicle-like, dehiscent . . . *Anaxagorea.*

○ ○ ○ Inner petals valvate, the tips incurved . . *Popowia.*

* * * *Petals valvate in bud, the outer ones spreading; the inner ones dissimilar, concave, connivent, arching over the stamens and pistil. Stamens many, closely packed, the anther-cells concealed by the overlapping connectives. Ovaries indefinite.*

× Inner petals not clawed.

Shrubs; inner petals smaller than the outer ones . . . *Oxymitra.*

Trees; inner petals much larger than the outer ones. . . . *Phœanthus.*

× × Inner petals clawed, usually smaller than the outer ones.

Trees or shrubs; ovules 1 or 2, near the base of ovary . . . *Goniothalamus.*

Trees; ovules many . . . . . *Mitrephora.*

* * * * *Petals valvate in bud, thick and rigid, connivent, the inner ones similar, but smaller, rarely wanting. Stamens many, closely packed, the anther-cells concealed by the produced connectives. Ovaries indefinite.*

Fruit fleshy, consisting of many connate carpels . . . . *Anona.*
Fruit carpels berry-like, free . . . . . *Melodorum.*

* * * * * *Petals imbricate or valvate in bud. Stamens often definite, loosely imbricate, the anther-cells not concealed by the overlapping connectives. Ovaries solitary or indefinite.*

○ Petals valvate.

Inner petals largest; ovules definite. Trees . . . . . *Miliusa.*
Trees; inner petals largest; ovules indefinite . . . . *Saccopetalum.*
Petals almost equal; ovules 4-8; trees . . . . . *Alphonsea.*
Inner petals shortest; ovules 2-4. Trees or shrubs . . . *Orophea.*

○ ○ Petals imbricate; almost equal; trees . . . *Bocagea.*

UVARIA, L.

Sepals 3, usually united at base, valvate in bud. Petals 6, imbricate in 2 rows, sometimes united at base. Stamens indefinite, the connective foliaceous or truncate-dilated, and produced beyond the anther-cells. Torus somewhat raised. Ovaries many, with numerous, rarely few or a single ovule in each. Berries differently shaped, many- or by abortion few- to 1-seeded.—Scandent, rarely erect shrubs, with opposite leaves and usually conspicuous flowers.

* *Ovules usually solitary, rarely 2 or 3. Often erect shrubs.* *U. ferruginea.*
* * *Ovules many, rarely few. Scandent shrubs.*

§ Flowers large or middling sized, the connective terminating into a large almost leafy appendage.

○ Carpels on long stalks.

Flowers solitary; carpels tomentose; all parts shortly tomentose . *U. purpurea.*
Flowers usually solitary; carpels tawny hirsute; all parts hirsute. *U. hirsuta.*
Flowers by 2 or 3 on a peduncle; carpels tubercled and stellately hispid-tomentose; all parts minutely puberulous . . . *U. ptychocalyx.*

○ ○ Carpels sessile, or on a very short stalk.

Peduncles 3- to 6-flowered; carpels glabrous . . . . *U. macrophylla.*
Peduncles 1- to 2-flowered; carpels tomentose . . . . *U. bracteata.*

§§ Flowers minute; the connective truncate, hardly produced beyond the anther-cell. Berries long stalked. *U. micrantha.*

1. **U. purpurea,** Bl.; H.f. Ind. Fl. i. 47.—An evergreen large scandent shrub, the softer parts covered with a dense, short, rusty-coloured tomentum; leaves elliptically oblong, 5-10 in. long, on a very short, thick, tomentose petiole, narrowed at the cordate base, shortly acuminate, densely stellate-tomentose, turning roughish above; flowers dark-purple, about 3 in. in diameter, solitary, on a thick, rusty-tomentose peduncle hardly 6-8 lin. long, bearing 1 or 2 large rotundate bracts; calyx rusty-tomentose; petals nearly equal, broadly ovate, shortly tomentose; berries numerous, narrowed into a long stalk, elongate-oblong, cylindrical, slightly pointed, marked by 2 parallel prominent ribs on the back, densely and shortly tomentose.

Hab. - Evergreen forests; not uncommon in Martaban and Tenasserim.—SS. = Metam.

2. **U. hirsuta,** Jack ; H.f. Ind. Fl. i. 48.—An evergreen large scandent shrub, the softer parts hirsute from long brownish hairs ; leaves 5-6 in. long, oblong, somewhat narrowed towards the rounded base, on a very short hirsute petiole, acuminate, hirsute, beneath stellately so ; flowers solitary or rarely by 2, on a very short jointed peduncle ; pedicels up to an in. long, brownish hirsute, supported at base by an oblong hirsute bract ; sepals rotundate, reflexed, densely hirsute outside, nearly as long as the petals ; petals oval, nearly ½ in. long, blood-red, puberulous ; carpels oblong to obovate-oblong, hirsute, 1-1½ in. long, on a stalk equally long.

Hab.—Rare in the tropical forests of the eastern slopes of the Pegu Yomah.—s.

3. **U. ptychocalyx,** Miq. ; H.f. Ind. Fl. i. 49.—*Tha-hwot-nway.*—An evergreen large scandent shrub, the softer parts covered with a rusty-coloured scurvy tomentum ; leaves oblong to obovate-oblong, 6-8 in. long, on a very short, thick, tomentose petiole, rounded or slightly cordate at base, coriaceous, shortly puberulous on both sides, glabrescent beneath ; flowers several together on a short, thick, one-bracted peduncle ; sepals and petals densely tomentose from very short fascicled hairs ; the former broad, acute, the latter oblong, acute ; carpels long-stalked, globular, or nearly so, tubercled-wrinkled and covered with a short tawny stellate-hispid tomentum, elevated-ribbed on the back.

Hab.—Not uncommon in the tropical forests of the southern slopes of the Pegu Yomah down to Tenasserim, Moulmein.—Fl. R. S. ; Fr. Dec.—Jan.—s : l.

4. **U. macrophylla,** Roxb. ; H.f. Ind. Fl. i. 49.—*Tha-hwot-nway.*—An evergreen large woody climber, all softer parts shortly tomentose ; leaves oblong or elliptically oblong, about ½-1 ft. long, on a short, thick, tomentose petiole, shortly acuminate, rounded or almost cordate at base, shortly stellate-tomentose, turning roughish above ; flowers about 1½ in. across, purple, on about ½ in. long tomentose bracted pedicels, arising several together from the short tomentose leaf-opposite peduncle hardly an in. long ; calyx rusty-tomentose ; petals ovate, acute, almost equal, shortly tomentose ; berries oblong to globular, fleshy and sappy, about 1 to 2½ in. long, on a very short, thick stalk or almost sessile, glabrous, yellow, then bluish black.

Hab.—Frequent all over Burma from Chittagong and Ava down to Tenasserim, especially in the mixed forests.—Fl. R. S. ; Fr. Nov.—Dec.—l.—SS. = ∞ .

5. **U. bracteata,** Roxb. ; H.f. Ind. Fl. i. 49.—An evergreen large woody climber, the younger parts tomentose ; leaves oblong to obo-ovate-oblong, 4-7 in. long, narrowed at the rounded base, on a short almost glabrous petiole, acute or shortly acuminate, thin, coriaceous, slightly puberulous, especially along the nerves, glossy above, pale beneath ; peduncles leaf-opposite, about ½ an in. long, pubes-

cent, usually 2-flowered, furnished with a leafy petioled deciduous bract; flowers pale-yellow, hardly ½ an in. across; sepals pubescent, united to the middle, pubescent; petals conniving, pubescent, the inner ones almost saccate at base; berries oblong, obtuse, almost sessile, 1-2 in. long, tomentose while young, afterwards puberulous.

Hab.—Tenasserim.—Fl. May; Fr. Sept.

6. **U. ferruginea,** Ham. (*Ellipeia ferruginea,* H. f. & Th. Ind. Fl. i. 52).—A low, erect shrub, 1½ to 3 ft. high, leafless in HS., all softer parts tawny tomentose; leaves oblong or obovate-oblong, 4-6 in. long, on a short, thick, tomentose petiole, blunt or mucronate, or rarely acute, obtuse at base, coriaceous, softly tomentose, more or less glabrescent above, the nerves and net-veination strongly prominent beneath; flowers solitary, on a short, thick, rusty-tomentose leaf-opposed peduncle bracted at its middle; sepals and petals greyish velvety, the latter ovate-oblong; berries cylindrically oblong, about 5-6 lin. long, almost sessile, red, glabrous, containing 1 rarely 2-3 cylindrical seeds.

Hab.—Not uncommon in the Eng and low forests of the Irrawaddi zone, and more especially in the Prome district; also Upper Tenasserim.—Fl. Apr.; Fr. Jan.—Feb.—l.—SS. = *Lat.*, Arg.

7. **U. micrantha,** H. f. & Th. Ind. Fl. i. 51.—An evergreen large woody climber, the shoots rusty-tomentose; leaves ovate-oblong to oblong-lanceolate, very shortly petioled, about 3-5 in. long, , shortly and bluntish or very long acuminate, rounded at base chartaceous or almost coriaceous, glossy above, slightly pubescent along the nerves beneath; flowers hardly 5 lin. in diameter, white, solitary, or by 2 or 3 on a bracted very short leaf-opposed or terminal tawny-tomentose peduncle; sepals roundish, rusty-puberulous outside; petals almost rotundate, pubescent; carpels the size of a pea, oval or globular, on a very long slender stalk, glabrous, 1-4-seeded.

Hab.—Rather frequent in tropical forests of the Andamans; also Tenasserim and Pegu.—Fl. June.—s: l.—SS. = petrophilous.

CYATHOCALYX, Champ.

Sepals united in a cyathiform 3-toothed calyx. Petals 6, free, valvate in 2 rows, concave at base and conniving round the genitals, flattened upwards and open. Stamens numerous, the connective truncate-dilated beyond the anther-cells. Torus depressed, conical, concave. Carpels solitary, with many ovules in a double row along the ventral suture; stigma large, peltate. Berry ovoid, large. Small trees, with glabrous leaves and solitary or clustered flowers.

1. **C. Martabanicus,** H. f. & Th. Ind. Fl. i. 53.—An evergreen tree, (30—40 + 8—20 + 2—3), all parts glabrous; bark dark brown, rather smooth, 1 to 2 lin. thick; cut dry, white; leaves oblong, 7-10 in. long, acute at base, abruptly and shortly acuminate, rather long-petioled, coriaceous, glossy, conspicuously and laxly netveined; flowers about 2 in. in diameter, on very short, thick, tomentose pedicels arising by 2 or 3 from the branches opposite the leaves; calyx and the lanceolate petals densely tomentose; berries solitary, large, about 2½-3 in. long, elliptically oblong, torose, glabrous.

Hab.—Rather frequent in the tropical forests from Martaban down to Tenasserim.—Fr. March—Apr.—s.—SS. = Metam.

Remarks.—Wood white, fibrous, but rather close-grained, perishable.

ARTABOTRYS, R. Br.

Sepals 3, valvate in bud. Petals 6, valvate in 2 rows, concave at base, conniving round the genitals, the flat or terete limb more or less spreading. Stamens numerous, the connective truncate-dilated beyond the anther-cells. Torus plano-convex. Ovaries numerous, with 2 erect ovules in each; the style ovate or linear-oblong. Berries variously shaped.—Scandent, rarely erect shrubs, the peduncles usually indurated and hooked; flowers solitary or clustered, usually yellow or yellowish-white.

§ *Petal-limb flattened.*
× Petals oblong-lanceolate, usually narrowed at base, the margins reflexed.
○ Flowers arising from hooked peduncles.
Young parts rusty-tomentose; leaves firmly coriaceous, glabrous; petals densely tawny-tomentose, 1¼ in. long . . *A. crassifolius.*
Quite glabrous; leaves thin, coriaceous; petals nearly 2 in. long, glabrous or puberulous; fruits quite glabrous and glossy. *A. odoratissimus.*
Tawny puberulous; petals about ½ in. long; fruits puberulous . *A. Siamensis.*
○○ Flowers arising directly from the lateral branchlets; no peduncle, or only an indication of it.
Adult parts all glabrous; small erect shrub . . . . . *A. Kurzii.*
×× Petals narrow, elongate-linear . . . . . *A. speciosus.*
§§ *Petal-limb terete or triquetrous, fleshy, subulate or linear.*
Petals triquetrous; branchlets and under-surface of leaves pubescent . . . . . *A. Burmanicus.*
Petals terete; all parts glabrous . . . . . *A. suaveolens.*

1. **A. crassifolius,** H. f. & Th. Ind. Fl. i. 54.—An evergreen large woody climber, the shoots and younger parts rusty-tomentose; leaves oblong or elliptically oblong, about ½ ft. long, obtuse or acute at base, on a rather short, thick petiole, apiculate, firmly coriaceous, glabrous, while young appressedly pubescent along the midrib beneath, glossy above; peduncles hooked, compressed, rusty velvety, usually shortly branched; flowers about 1½ in. long, on short, thick, rusty pubescent pedicels; sepals oblong-lanceolate, bluntish, densely rusty pubescent outside; petals oblong-lanceolate, somewhat nar-

rowed at base, bluntish, coriaceous, densely tawny pubescent, the outer ones larger, $1\frac{1}{4}$ in. long by $\frac{1}{2}$ broad, the inner ones somewhat narrower.

Hab.—Tenasserim.

2. **A. odoratissimus,** R. Br.; H.f. Ind. Fl. i. 54.—A large half-scandent shrub, all parts glabrous; leaves oblong or oblong-lanceolate, 8-4 in. long, acute at base, bluntish acuminate or almost apiculate, thin coriaceous, quite glabrous; flowers rather large, greenish, turning yellow and fragrant, on thick nearly an in. long glabrous pedicels, arising solitary or by pairs from the hooked almost terete glabrous peduncle; sepals glabrous; petals oblong-lanceolate, rather blunt, coriaceous, somewhat narrowed at the concave base, nearly 2 in. long when full-grown, glabrous or puberulous outside at the base, all conform, or the 3 inner ones somewhat smaller; berries as large as a plum, numerous, unequally oblong, narrowed at base and almost sessile, glossy, when ripe yellow, apiculate.

Hab.—Tenasserim, banks of rivers, as Attaran, &c.; Ava, Mandalay (cult.?).—Fl. H. & R. S.; Fr. C. S.

3. **A. Siamensis,** Miq.—An evergreen large scandent shrub, the younger parts rufous pubescent; leaves obversely oblong to oblong and obovate-oblong, on a rufous pubescent petiole about $1\frac{1}{2}$-$2\frac{1}{2}$ lin. long, usually rather acute at the base, bluntish apiculate or blunt, 6-$2\frac{1}{2}$ in. long, chartaceous, soon glabrescent above, beneath shortly tawny pubescent; flowers of the shape and size of *A. odoratissimus,* solitary on the hooked puberulous peduncles of the length of the pubescent pedicels; sepals puberulous, triangular; petals about $\frac{1}{2}$-$\frac{2}{3}$ in. long on both sides, except inside at the base, softly and shortly tomentose, narrowly elliptical, narrowed above the broader base, rather blunt, thick; carpels ellipsoid, the size of a large cherry, constricted into a very short stalk, while young pubescent.

Hab.—Adjoining Siamese province of Kanbooree.—Fl. Fr. May.

4. **A. Kurzii,** H.f. & Th. Ind. Fl. i. 54.—A low, bushy, erect shrub, 2 to 3 ft. high, leafless during HS., the shoots appressed tawny pubescent; leaves obovate, blunt or apiculate, acute at base, 3 to 4 in. long, on a short and thin petiole, membranous, glabrous, appressed pubescent along the nerves beneath, laxly net-veined between the prominent nerves; flowers solitary, rather large, yellowish, on a shortly hirsute about 6 to 8 lin. long pedicel, arising from a lateral hook-like dilatation of the lateral branchlets; sepals reflexed, tawny pubescent; petals oblong-lanceolate, usually with the margins revolute, keeled, rather blunt, coriaceous, puberulous, an in. long, the inner ones somewhat smaller; anthers red; berries unknown.

Hab.—Not unfrequent in the Eng forests of the Irrawaddi zone and in Toukyeghát, Martaban.—Fl. Apr.—l—SS. = Lat.

5. **A. speciosus,** Kz.; H.f. Ind. Fl. i. 55.—An evergreen large woody climber, the young shoots sprinkled with appressed hairs; leaves oblong or oblong-lanceolate, 6 to 7 in. long, on short glabrous petioles, bluntish acuminate or apiculate, acute at base, thinly coriaceous, glabrous, glossy above; peduncles compressed, rather short, hooked and incurved, puberulous, usually leaf-opposite, or nearly so, bearing several nearly 2½ in. long yellow fragrant flowers on about 2 lin. long tawny puberulous pedicels; sepals broadly cordate, rather blunt, slightly puberulous outside; petals clothed with a tawny tomentum intermixed with long, soft, silky hairs, thick coriaceous, nearly 2¼ in. long, linear, rather blunt; torus tawny tomentose; carpels glabrous.

Hab.—In the tropical forests along Middle Straits, Andamans.—Fl. May.

6. **A. Burmanicus,** A. DC.; H.f. Ind. Fl. i. 55.—An evergreen large woody climber, the younger parts densely tawny tomentose; leaves oblong or oblong-lanceolate, abruptly acuminate or apiculate, rounded or obtuse at base, on a short pubescent petiole, 5-6 in. long, chartaceous, midrib above and under-surface rusty or greyish pubescent, more or less glabrescent; peduncles rather short, compressed, hooked, and usually 2-cleft at apex, tawny puberulous, almost leaf-opposite, usually 1-flowered; petals filiform-subulate, triquetrous, greyish pubescent; carpels obovate-oblong, almost glabrous, about 9 lin. long.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah; also Ava and Tenasserim from Moulmein down to Mergui.—Fl. R.S.; Fr. Jan. Febr.—s.

7. **A. suaveolens,** Bl.; H.f. Ind. Fl. i. 55.—An evergreen large woody climber, the shoots puberulous; leaves elliptically oblong to oblong-lanceolate, 4-5 in. long, at the acute or obtuse base usually narrowed into a rather short glabrous petiole, acuminate, coriaceous, glabrous or pubescent on the midrib beneath, shining above, the nerves and net-veination on both sides conspicuous; peduncles short, compressed and hooked, puberulous, several-flowered; flowers fragrant, small, yellow, on rather thick about 4 to 5 lin. long pedicels; petals about 6 lin. long, broad and concave at base, with an elongate club-shaped blunt limb.

Hab.—Chittagong; Tenasserim.

CANANGA, Rumph.

Sepals 3, valvate in bud. Petals 6, valvate in 2 rows, nearly equal, or the inner smaller. Stamens indefinite, closely packed, the

connective ovate, acute. Torus slightly convex and somewhat concave in the centre. Ovaries many, with numerous ovules in 2 rows; style narrow-oblong; stigma capitate. Berries stalked. Seeds embedded in pulp.—A large tree, with rather large solitary or fascicled flowers.

1. **C. odorata,** H. f. & Th. Ind. Fl. i. 56.—*Kadapgnam.*—An evergreen large tree, the shoots more or less appressed greyish-pubescent; leaves ovate-oblong, about 5 to 8 in. long, rather long-petioled, rounded at base, often somewhat oblique, acuminate, membranous, glabrous above, puberulous along the nerves beneath, soon quite glabrous; flowers pale-yellow, fragrant, on very long slender puberulous pedicels, arising by 4 to 6 or fewer from short or elongate peduncles above the scars of the fallen leaves; sepals rotundate, somewhat acute, greyish velvety; petals nearly 3 in. long, linear-lanceolate, acuminate, greyish velvety; berries on more than an in. long stalks, oval or oboval, glabrous, about $\frac{3}{4}$ in. long, black; seeds numerous, irregularly pitted.

Hab.—Tenasserim, along the Salween, Martaban; also Ava (cult. ?)

CYATHOSTEMMA, Griff.

Sepals 3, connate. Petals 6, valvate in 2 rows, short, with fleshy base, the inner ones rather smaller. Torus flat, with convex margin. Stamens many, linear; anthers almost introrse, the connective process obliquely incurved. Ovaries many; style cylindrical, notched; ovules many, in 2 series. Ripe carpels turgid, many-seeded.

1. **C. viridiflorum,** Griff.; H. f. Ind. Fl. i. 57.—A shrub? leaves obovate-oblong or oblong-lanceolate, acuminate or apiculate, 4-8 in. long, on a $\frac{1}{6}$-$\frac{1}{4}$ in. long petiole, glabrous; flowers $\frac{1}{2}$ in. in diameter, forming brown-tomentose cymes; petals tomentose, granular; ovaries densely tomentose; carpels 1-1$\frac{1}{2}$ in. long, oblong, glabrous, on a stout stalk equally long.

Hab.—Tropical forests of South Andaman.

UNONA, L.

Sepals 3, valvate. Petals 6, valvate in 2 rows, almost equal, or the inner ones smaller or wanting. Stamens numerous, closely packed, cuneate-4-gonous, the connective beyond the anther-cells globular or truncate-dilated. Torus somewhat raised, flat or slightly concave. Ovaries numerous, with 2 or more ovules in a single row; style ovate or oblong, rarely elongate. Berries usually stalked, often moniliform and elongate, rarely ovoid and continuous.—Trees or shrubs, with usually rather large, solitary flowers.

* *Petals* 6. *Berries neckless-like constricted between the seeds.*

× Petals glabrous.

Leaves glabrous, pale-coloured beneath; peduncles only ½ to 1½ in. long, axillary and occasionally terminal . . . . . *U. Dunalii.*

×× Petals appressed pubescent or puberulous.

Leaves glabrous, glaucous beneath; peduncle 1-2 in. long; petals 2 in. by 1 broad . . . . . *U. discolor.*

Leaves beneath glaucous and usually pubescent; peduncle 4-8 in. long; petals 2½ in. by 1 broad . . . . . *U. desmos.*

Leaves while young greyish tomentose; peduncle 4-8 lin. long; petals 1-1¼ in. long, oblong . . . . . *U. latifolia.*

Leaves pale-coloured and pubescent along the nerves beneath; peduncle ¼-½ in. long; petals 2 to 3 in. long, very narrow-linear . *U. stenopetala.*

** *Outer petals* 3, *large, the inner ones quite suppressed.*

Petioles rather long; petals 4-6 in. long . . . . . *U. longiflora.*

Leaves almost sessile, cordate at base; petals nearly 3 in. long . *U. Dasymaschala.*

* *Petals* 6. *Berries neckless-like constricted between the seeds.*

1. **U. Dunalii,** Wall; H. f. Ind. Fl. i. 58.—A scandent shrub, the younger parts pubescent; leaves oblong to oblong-lanceolate, 3-4½ in. long, obtuse or rounded at base, on a 3 lin. long puberulous petiole, blunt or acuminate, glabrous or appressed pubescent beneath; peduncle ½-1½ (in fruit sometimes up to 4) in. long, axillary or terminal, bearing 1 to 3 scale-like bractlets below the middle; flowers pale-yellowish, sweet-scented; sepals broad, ovate, somewhat acute; petals almost glabrous, from a broad base lanceolate, the outer ones 1½ in. long; berries on a strigose stalk 3 to 6 lin. long, glabrous or pubescent, wrinkled, 1-3 jointed.

Hab.—Chittagong, in forests on the Seetakoond hills.

2. **U. discolor,** Vhl.; H. f. Ind. Fl. i. 59.—An evergreen shrub, the shoots appressed tawny pubescent; leaves obovate-oblong or oblong-lanceolate, 4-6 in. long, on a 2-3 lin. long petiole, rounded or obtuse at base, shortly and usually bluntish acuminate, glabrous and glossy above, glaucescent beneath; flowers solitary, dirty greenish, turning yellow or pale-ochre coloured, on a very slender 1-2 in. long 1-bracted peduncle; sepals almost free at base, membranous, pubescent or almost glabrous, ovate-lanceolate, acute; petals elongating, from a broader base lanceolate, 2 in. long or longer, bluntish, silkhairy or almost glabrous, the inner ones narrower and usually also a little shorter; berries 6-1-jointed, on a 2 to 10 lin. long stalk, greenish-purple, minutely wrinkled, the joints broadly oval, the size of a pea.

Hab.—Tropical forests and moister upper mixed forests from Chittagong and Ava down to Tenasserim.—Fr. Jan.

3. **U. desmos,** Dun.; H. f. Ind. Fl. i. 59.—An evergreen shrub, 8 to 10. ft. high, the shoots sprinkled with stiff tawny appressed hairs; leaves oblong to linear-oblong, 6 to 8 in. long, rounded at base, on a 3 to 4 lin. long pubescent petiole, acute or acuminate, nearly coriaceous, glabrous and glossy above, glaucescent and

sparingly appressed pubescent beneath, soon glabrous; peduncles arising below the insertion of the petioles and opposite to them, about 4 to 8 in. long, slender, nodding, furnished with a small bract below their middle; sepals ovate-lanceolate, acuminate; petals appressed pubescent, ovate-lanceolate, about 1½ in. long, or somewhat longer; berries on a ¾ to 1 in. long stalk, 5-1-jointed, strigose, or nearly glabrous, the joints almost globular, the size of a pea.

Hab.—Frequent in tropical and low forests all over Pegu and Martaban; also Tenasserim.—Fl. June; Fr. Oct.—s.

4. **U. latifolia,** H.f. & Th. Ind. Fl. i. 60.—A tree (50 + ? + 2), shedding leaves in the HS., the younger parts greyish tomentose; leaves (young) about 3 in. long and broad, rotundate or broadly ovate-oblong, rounded or almost cordate at base, on a densely tomentose petiole ½ in. long, very shortly apiculate, shortly pubescent above, greyish tomentose beneath, the rib and nerves prominent and strong; peduncles arising laterally below the insertion of the petioles, 4-8 in. long, thick and densely tomentose, furnished with a leafy tomentose bract at about the middle; flowers solitary, about 1½ in. long; sepals oblong, acute, densely greyish pubescent; petals oblong-lanceolate, narrowed at base, bluntish acuminate, or almost blunt, parallel-veined, greyish tomentose, 1 in. long, or somewhat longer, the inner ones somewhat smaller.

Hab.—Martaban; dry hill forests on limestone rocks along the Nga choung of the Salween river.—Fl. May.

5. **U. stenopetala,** H.f. & Th. Ind. Fl. i. 60.—A tree, the shoots appressed tawny pubescent; leaves obovate-lanceolate to linear-oblong, narrowed towards the obtuse or obliquely rounded base, 4-6 in. long, very shortly petioled, acuminate, glabrous above, pubescent along the nerves beneath; peduncles arising from the older branches, united in a woody variously-branched mass sustained by bracts; flowers fascicled, on ¼-½ in. long pubescent pedicels supported by 1 or 2 lanceolate bractlets; sepals almost united at base, 4 lin. long, pubescent outside and ciliate; petals narrow-linear, 2-3 in. long, hardly a line broad, silky puberulous outside, the outer ones slightly dilated at base, united, bluntish keeled; ovaries oblong, villous.

Hab.—Tenasserim, Moulmein.

* * *Outer petals* 3, *large, the* 3 *inner ones quite suppressed.*

6. **U. longiflora,** Roxb.; H.f. Ind. Fl. i. 61.—An evergreen shrub, all parts glabrous; leaves oblong to linear-oblong, on a ½ to ¾ in. long petiole, rounded or obtuse at base, 6-15 in. long, acute or acuminate, glabrous, glossy above, glaucous beneath; peduncles axillary, several-bracted towards the base, very variable in length

(1-4-6 in.), 1-flowered ; flowers orange-coloured outside, yellowish inside, about 5-6 in. long; sepals rounded-reniform, mucronate, hardly 2 lin. long, pubescent outside ; petals 3, usually 2 of them united, elongate-linear-lanceolate, usually twisted at their tips, glabrous ; berries on a $\frac{1}{4}$-1 in. long stalk, 1-4-jointed, glabrous, the joints oblong or oval, c. 4-8 lin. long.

Hab.—Chittagong.

7. **U. Dasymaschala,** Bl. ; H.f. Ind. Fl. i. 61.—An evergreen shrub or little tree, 15-20 ft. high, the shoots pubescent or tawny tomentose ; leaves obovate-oblong, cordate or rarely rounded at base, on a thick petiole a line long, acute or acuminate, 5-9 in. long, glabrous, opaque, glaucous beneath ; peduncles axillary, slender, 1-1$\frac{1}{2}$ in. long, minutely bracteoled at base, 1-flowered ; sepals broadly ovate, mucronate, about 3 lin. long ; petals linear-lanceolate, flat, coriaceous, nearly 3 in. long, while young pubescent outside ; berries on tawny pubescent stalks about 3 lin. long, 7-1-jointed, strigose-pilose, soon glabrescent, the joints oblong.

Hab.—Frequent in the tropical forests of Martaban and Tenasserim ; also on the Andamans and Ava.—Fl. Febr.—May.—s.

POLYALTHIA, Bl.

Sepals 3, usually valvate. Petals 6, valvate in 2 rows, but spreading or opened long before full-sized, nearly equal and flat. Stamens numerous, cuneate, the connective truncately dilated beyond the anther-cells. Torus slightly raised, flat or slightly concave. Ovaries numerous, with 1 or 2 erect ovules ; style short, oblong or capitate. Berries stalked, globose or oblong, 1-seeded.—Trees or shrubs, with the flowers solitary or fascicled, axillary or leaf-opposite.

* *Flowers hermaphrodite. Petals flat. Ovules solitary, erect.*

§ Flowers usually rather large ; carpels oblong, or elongate, or cylindrical.

× Petals linear to linear-lanceolate, or spatulate-linear.

Leaves glabrous, one-coloured, apiculate or shortly acuminate ; carpels obversely ovoid . . . . . *P. simiarum.*

Leaves glabrous, glaucous, or whitish beneath, shortly acuminate . *P. Sumatrana.*

× × Petals ovate to ovate-lanceolate and elliptical.

Carpels almost globular, glabrous ? ; leaves glabrous . . . *P. nitida.*

Carpels velvety ; leaves beneath puberulous along the nerves . . *P. membranacea.*

Carpels elongate-oblong, glabrous ; leaves oblong, the nerves pubescent . . . . . *P. Jenkinsii.*

§ § Flowers small, on slender pedicels ; carpels globular, pea-shaped.

Leaves along the nerves beneath pubescent, blunt or nearly so . *P. suberosa.*

Leaves pubescent beneath, acuminate . . . . . *P. cerasoides.*

* * *Flowers hermaphrodite. Petals flat. Ovules 2, superposed, ascending.*

Flowers small, sessile or nearly so, sometimes clustered . . . *P. dubia.*

* *Flowers hermaphrodite. Petals flat. Ovules solitary, erect.*

1. **P. simiarum,** Bth. & H. f. Ind. Fl. i. 63.—A tree (90—100 + 60 — 70 +6—10), the shoots puberulous or slightly pubescent; bark about an in. thick, greenish grey, rather smooth, longitudinally fissured, spongy within, brownish-grey; leaves oblong or ovate-oblong, on short glabrous or puberulous petioles, apiculate or shortly acuminate, rounded or obtuse at base, 7 to 10 in. long, glabrous or slightly puberulous along the nerves beneath; peduncles laterally arising from the branches, tomentose, shortened; flowers nearly 2 in. in diameter, greenish yellow or purplish inside, on 1½ to 2 in. long shortly tomentose or puberulous pedicels, furnished with a deciduous small bract below their middle; petals linear-oblong to oblong-spatulate, blunt or nearly so, glabrous or puberulous; torus tawny tomentose; berries the size of a plum, on long stalks thickened upwards, oblong, glossy, orange-red, turning bluish black, smooth.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban; also Tenasserim.—Fr. May-June.—s: l.—SS. = SiS., *Metam.*, Lat. p.

Remarks.—Wood white, turning yellowish.

2. **P. Sumatrana,** Kz.—An evergreen shrub or tree? all parts glabrous; leaves lanceolate or oblong-lanceolate, on a 3 to 4 lin. long petiole, 4—6 in. long, shortly and rather bluntish acuminate, coriaceous, glabrous, glaucous or almost whitish beneath; flowers rather large, solitary from above the scars of the fallen leaves, on 7 to 9 lin. long glabrous peduncles; sepals minute, ovate, acute; petals almost 1½ to 2 in. long, linear-lanceolate, narrowed at both ends, the inner ones a little shorter; ripe carpels stalked, many or few on the convex torus, ellipsoid, somewhat acute, glabrous.

Hab.—Tenasserim (or Andamans?).

3. **P. nitida,** Bth. & H. f. Ind. Fl. i. 64.—An evergreen small tree, all parts quite glabrous; leaves large, from ½ to 1 ft. long, oblong-lanceolate, on a very thick petiole c. 3 lin. long, bluntish or shortly acuminate, obtuse at base, chartaceous, glabrous; (flowers axillary, solitary, on about an lin. long peduncle jointed near the base and bearing an oval bract at the middle; sepals united up to the middle, rotundate, blunt, about 6 lin. long, pubescent, almost ciliate; petals oval, thick, rusty velvety inside, nearly an in. long, the inner ones somewhat smaller; ovaries linear, 4-cornered); berries large, stalked, almost globular.

Hab.—Tenasserim.

4. **P. Jenkinsii,** Bth. & H. f. Ind. Fl. i. 64.—An evergreen tree (25—30 + 9 — 15 + 1½ — 2), the younger parts shortly tomen-

tose; leaves ovate-oblong or oblong, 6-7 in. long, on a 2-3 lin. long, thick, tomentose petiole, rounded or obtuse and usually more or less oblique at base, acuminate, chartaceous, glabrous, the nerves slightly and shortly tomentose beneath, the netveination lax, but conspicuous; flowers yellowish-white, solitary, axillary, on a shortly tomentose pedicel 4 to 6 lin. long; sepals oblong, blunt; petals oblong-lanceolate, acuminate, about an in. long, 2-3 lin. broad, glabrous; berries several, elliptically oblong, mucronate, ½ in. long, on a slender stalk of similar length.

Hab.—Frequent in the tropical forests of South Andamans and the adjacent islands.—Fl. Begin. of R. S.—s.—SS. = Chloritic rocks and SiS.

5. **P. suberosa,** Bth. & H. f. Ind. Fl. i. 65; Brand. For. Fl. 5.—A small deciduous tree or shrub, the younger parts slightly pubescent; leaves oblong or obovate-oblong, very shortly petioled, usually narrowed and rounded at base, 3-4 in. long, blunt or bluntish apiculate, chartaceous, more or less puberulous beneath, soon quite glabrescent; flowers hardly ½ in. across, greenish white, on a ½ to 1 in. long pubescent 1-bracted peduncle, arising solitary or by pairs; sepals small, pubescent; petals oval, blunt, pubescent, about 8-9 lin. long, the inner ones nearly doubled shorter; torus tomentose; berries the size of a pea, globular, mucronulate, on long slender stalks, somewhat silky, soon glabrous.

Hab.—Upper Tenasserim.—Fr. Febr.

6. **P. cerasoides,** Bth. & H. f. Ind. Fl. i. 63; Bedd. Sylv. Madr. t. 1; Brand. For. Fl. 5.—A small tree, leafless in HS., the younger parts pubescent; leaves lanceolate or oblong-lanceolate, 4-5 in. long, acute at base, on a short tomentose petiole, acuminate, softly pubescent beneath, except the midrib glabrous above; flowers about 8-10 lin. in diameter, on a slender ½ to 1 in. long pedicel, arising by 1-3 from wart-like axillary peduncles; sepals about 4 lin. long, pubescent; petals hardly longer, ovate- or linear-oblong, coriaceous, appressed puberulous; torus pubescent; berries ovoid, apiculate, on long slender stalks, thinly puberulous, black.

Hab.—Prome.—Fr. Sept.-Oct.

7. **P. dubia,** Kz. (*P. macrophylla,* H. f. & Th. Ind. Fl. i. 66, not Bl.)—An evergreen small tree or shrub, the younger parts tawny or pale tomentose; leaves oblong or elliptically oblong, acute or obtuse and often oblique at base, 7-8 in. long, on a rather short, thick, tomentose petiole, acute or bluntish acuminate, coriaceous, glabrous above, beneath pale coloured, and along the nerves (especially on the midrib) tomentose, glabrescent; flowers small, little opened, on very short, thick, bracted pedicels, or almost sessile, solitary, or by 2-3 arising laterally from the branches or from above the axils of the

leaves; sepals broadly oblong, acute, densely tawny pubescent outside; petals broadly oval, acute, concave, densely pale or tawny silk-hairy outside, the inner ones hardly longer and a little narrower.

HAB.—Frequent in the tropical forests of the Andamans; Upper Tenasserim.—Fl. May-June.—s.

P. costata; *H. f. & Th.*—Is a small tree from Tenasserim, but incompletely known.

ANAXAGOREA, St. Hil.

Sepals 3, valvate, connate at base. Petals 6, nearly equal, in 2 series, valvate. Torus convex. Stamens indefinite; anther-cells extrorse or sublateral, the connective with a terminal process. Ovaries few or many; style variable; ovules 2, almost basilar, collateral, ascending. Ripe carpels dehiscent, follicle-like, stalked. Seeds 1 or 2, with a shining testa.—Shrubs, with small white leaf-opposed flowers.

1. **A. Luzonensis,** A. Gray; H. f. Ind. i. 68.—An evergreen small shrub, 2-4 ft. high, all parts glabrous; leaves oblong or oblong-lanceolate, acute at base, abruptly acuminate, 6-7 in. long, glabrous, rather long-petioled; peduncles very short or reduced; flowers solitary or by 2 or 3, about 5-8 lin. in diameter, white, on a short few-bracted pedicel; sepals and petals broadly oval; of the latter the outer ones thick and fleshy, the inner ones of a somewhat thinner texture; ripe carpels 1-3, rarely 4, cuneate-obovate, somewhat compressed, narrowed in a thick stalk 8-10 lin. long, 1-2-seeded.

HAB.—Not unfrequent in the tropical forests of Martaban and the southern slopes of the Pegu Yomah; also Andamans.—Fl. May-June; Fr. Aug.—s.

POPOWIA, Endl.

Sepals 3, ovate, valvate. Petals 6, valvate in 2 series, the outer ones sepal-like, spreading, the inner ones thick, concave, connivent, acute, or the tips usually inflexed. Stamens indefinite or nearly so, cuneate; anther-cells dorsal, remote. Ovaries few, about 6, ovoid; style oblong or almost clavate, straight or recurved; ovules 1-2 on the ventral suture, rarely 1 and basilar. Carpels berry-like, globular, or ovoid, stalked.—Trees, with small extra-axillary or leaf-opposed flowers.

1. **P. Helferi,** H. f. & Th. Ind. Fl. i. 69.—A small spreading tree, the branchlets coarsely hairy; leaves short-petioled, narrowly oblong, 2½-5 in. long, abruptly acuminate, rounded or almost oblique

at base, beneath along the midrib puberulous; flowers minute, globose, on a tomentose peduncle $\frac{1}{12}$-$\frac{1}{4}$ in. long; sepals and outer petals ovate, strigose; inner petals orbicular, concave, densely strigose, the tip inflexed; stamens 15; carpels 6, densely strigose.—(After H. f. & Th.)

Hab.—Not unfrequent in the tropical forests of South Andaman; Tenasserim, King's Island.

OXYMITRA, Bl.

Sepals 3, usually united at base, valvate. Petals 6, valvate in 2 series, the outer ones elongated, narrow, the inner smaller and broader, conniving round the genitals, sometimes narrowed at base. Stamens numerous, linear-oblong, the connective truncate, dilated beyond the anther-cells. Torus conical or almost truncate. Ovaries many, with 1 or 2 ascending ovules in each; style obovate. Berries stalked, 1-seeded.—Shrubs or trees, with solitary usually large flowers.

* *Sepals short, coriaceous,* 2-3 *lin. long.*

Petals from a broad base narrowly linear, nearly 2 in. long, slightly pubescent . . . . . *O. stenopetala.*

Petals oblong-lanceolate, blunt, very thick, tawny puberulous . *O. Maclellandii.*

Incompletely known . . . . . *O. unonaefolia.*

** *Sepals* (*as in Goniothalamus*) *large, membranous, and nerved, about* 7-8 *lin. long.*

Petals oblong-lanceolate, about 1½ in. long, acute, tawny pubescent . . . . . *O. fornicata.*

1. **O. stenopetala,** H. f. & Th. Ind. Fl. i. 71.—A shrub? the shoots tawny pubescent; leaves 10-12 in. long, oblong or elliptically lanceolate, acute or nearly so, obtuse or rounded at base, on a thickened petiole c. 3 lin. long, chartaceous, glabrous, glaucous beneath; flowers rather large, solitary, on a 2 lin. long puberulous lateral pedicel; sepals ovate, acute, coriaceous, about 2 lin. long, puberulous; outer petals nearly 2 in. long, from a broad base narrow-linear, slightly pubescent or puberulous; the inner ones 7-8 lin. long, ovate-oblong, long and narrowly acuminate.

Hab.—Upper Tenasserim.—Fl. Apr.

2. **O. Maclellandii,** H. f. & Th. Ind. Fl. i. 70.—An evergreen erect shrub, 4 ft. high, the shoots and young branches coppery appressed pubescent; leaves oblong or oblong-lanceolate, 9-10 in. long, rounded at base, on a short strong puberulous petiole, acuminate, almost coriaceous, glabrous, glossy above, glaucescent beneath, strongly transversely veined; flowers large, yellowish, solitary, on a thick, tawny tomentose 1-bracted pedicel c. 1-1½ lin. long; sepals about 3 lin. long, broadly ovate, somewhat acute, tawny pubescent, coriaceous; petals very thick coriaceous, appressed

tawny puberulous, the outer ones oblong-lanceolate, about 14-16 lin. long, almost keeled, blunt, the inner ones c. 8-10 lin. long and somewhat broader.

Hab.—Not unfrequent in the tropical forests and in shady localities in the low forests of the southern slopes of the Pegu Yomah.—Fl. May-June.—s.—SS.=Lat. p.

3. **O. unonaefolia,** H. f. & Th. Ind. Fl. i. 71.—A woody glabrous climber, the leaf-buds appressed golden-pubescent; leaves oblong, 5-7 in. long, rounded or almost acute at base, on a $\frac{1}{4}$-$\frac{1}{3}$ in. long petiole, abruptly caudate acuminate, glabrous and shining above, very glaucous beneath; peduncles extra-axillary; sepals broadly ovate, brown pubescent; carpels oblong, stalked, glabrous.

Hab.—Tenasserim, Tavoy.

4. **O. fornicata,** H. f. & Th. Ind. Fl. i. 71.—A large scandent shrub, the younger parts coppery pubescent; leaves oblong, oblong-lanceolate or lanceolate, 4-6 in. long or longer, usually somewhat narrowed towards the rounded base, on a short tomentose petiole, acuminate, adult glabrous above, beneath glaucous and greyish pubescent, conspicuously transversely veined, the midrib often rusty-tomentose; flowers solitary, rather large, yellowish, on very short lateral tomentose peduncles; sepals about 7-8 lin. long, ovate or ovate-lanceolate, blunt or nearly so, membranous, appressed pubescent; petals tawny puberulous, thin coriaceous, the outer ones oblong-lanceolate, about 2 in. long, 3-nerved, rather blunt, the inner ones very short, hardly 4 lin. long, ovate, acute, connivent, concave at base; berries cylindrical, elongate-oblong, almost sessile, nearly an in. long, tawny pubescent.

Hab.—Not unfrequent in the tropical forests of South Andaman; also Tenasserim.—Fl. May.—s.

GONIOTHALAMUS, Bl.

Sepals 3, usually large, valvate. Petals 6, in 2 rows, valvate, the outer ones flat, the inner ones united in a conical mitra round the genitals, and at base narrowed in a broad claw. Stamens numerous, the connective beyond the anther-cells ovate or capitate. Torus truncate or excavate in the centre. Ovaries numerous, with 2 superposed ovules in each; style oblong or elongated. Berries 1-seeded.—Small trees or shrubs, with solitary, axillary, or lateral flowers.

Flowers about 9 lin. long	*G. sesquipedalis.*
Flowers about 2 in. long	*G. Griffithii.*

1. **G. sesquipedalis,** H. f. & Th. Ind. Fl. i. 73.—An evergreen shrub? all parts glabrous; leaves lanceolate or linear-oblong, 9-13

in. long and longer, on a thick petiole, 8-9 lin. long acuminate or acute at base, coriaceous, abruptly or bluntish acuminate, quite glabrous; flowers solitary or rarely paired, hardly 9 lin. long, yellowish, on a 1-3 lin. long pedicel, furnished with a few scale-like bracts; sepals ovate, glabrous, about 3 to 4 lin. long, membranous; petals almost equally long, about 2 in. long, the outer ones oblong, long acuminate, puberulous or almost glabrous, the inner ones united in an elongated mitre, densely tawny pubescent within; berries oval, very shortly stalked, about 8 lin. long, glabrous, red.

Hab.—Tenasserim; Ava, Kakhyen hills.

2. **G. Griffithii,** H. f. & Th. Ind. Fl. i. 73.—An evergreen large shrub, all parts glabrous; leaves oblong or elliptically oblong, about a foot long or thereabouts, on an $\frac{1}{2}$-$\frac{2}{3}$ in. long petiole, bluntish acuminate, obtuse or acute at base, coriaceous, glabrous; flowers large, usually solitary, axillary, or lateral, on a glabrous c. $\frac{1}{2}$ in. long peduncle supported by some scale-like bracts; sepals about 1 in. long, acute, membranous, nerved, puberulous or nearly glabrous; the outer petals 2 in. long, oblong-lanceolate, acuminate, glabrous, the inner ones 6-7 lin. long, thick coriaceous, slightly pubescent, conically-mitrate; berries oblong, very shortly stalked, glabrous.

Hab.—Rather rare in the tropical forests of the eastern slopes of the Pegu-Yomah (headwaters of Swa choung); Martaban; Tenasserim.—Fl. R. S.—s.

MELODORUM, Dun.

Sepals 3, small, united at base, valvate. Petals 6, in 2 rows, valvate, nearly conform and thick-fleshy, connivent, the inner ones smaller or triquetrous upwards. Stamens numerous, the connective beyond the anther-cells oval, oblong, or truncate. Torus conically convex. Ovaries numerous, with 2 or more ventral ovules in each; style oblong. Carpels berry-like, stalked. Shrubs, often scandent, with terminal or leaf-opposed flowers.

* *Calyx cyathiform, 3-lobed. Flowers 4-5 in. long* . *M. macranthum.*
** *Calyx deeply 3-cleft; flowers small, 1 in. or less long.*
Flowers about an in. long; carpels tomentose . . . . *M. rubiginosum.*
Flowers 3-4 lin. long . . . . . *M. Griffithii.*
Flowers nearly an in. long; carpels densely verrucose, pubescent . *M. verrucosum.*
Flowers 1 in. long; carpels almost glabrous . . . . . *M. bicolor.*

1. **M. macranthum,** Kz.—An evergreen tree 20—25 feet high, glabrous, the leaf-buds tawny velvety; leaves oblong or elliptically oblong, on a rather short glabrous strong petiole, acute at base, 6-7 in. long, shortly acuminate or apiculate, membranous glabrous; flowers white, large, on about an in. long puberulous pedicels, arising solitary and laterally from the branches; sepals spreading, ovate, 5-6 lin. long, rather blunt, glabrous, coriaceous; petals white, turning

yellowish, the outer ones linear-lanceolate, nearly 5 in. long, acuminate, glabrous; the inner short, about an in. long, blunt, puberulous and glabrescent outside, minutely villous inside.

HAB.—Rather rare in the tropical forests of South Andaman.—Fl. June.—s.

2. **M. rubiginosum,** H. f. Ind. Fl. i. 79.—An evergreen scandent shrub, the younger parts densely tawny pubescent; leaves oblong or broadly oblong, 6-12 in. long, obtuse or almost cordate at base, on a thick tomentose petiole 8-9 lin. long, apiculate or acute, rarely blunt, coriaceous, the midrib above and the whole under-surface rusty or tawny tomentose; flowers rather large, axillary, on an in. long or longer bracted pedicel, solitary, or often forming a 5-6-flowered terminal rusty tomentose panicle; sepals broad, nearly a line long; the outer petals more than an in. long, oval-oblong, tawny tomentose outside, the inner somewhat shorter and narrower; berries ovoid, about an in. long, long-stalked, tawny tomentose.

HAB.—Rare in the tropical forests of Martaban; also Tenasserim and Chittagong.

3. **M. Griffithii,** H. f. & Th. Ind. Fl. i. 80.—A large scandent shrub, all younger parts tawny tomentose; leaves oblong or narrow-oblong, 3-5 in. long, rounded at base, on a pubescent petiole 4 lin. long, rather blunt, notched, coriaceous, the midrib above and the whole under-surface tawny pubescent; flowers ½ in. long, on tomentose 3-4 lin. long pedicels, arising by 2 to 5 or more from leaf-opposed short peduncles or forming a cyme on the short axillary branchlets; sepals oval, blunt, tomentose; the outer petals oblong, blunt, tomentose outside; the inner ones shorter, triquetrous and acute at the tip; ovaries densely yellowish strigose.

HAB.—Tenasserim.—Fl. Decb.

4. **M. verrucosum,** H. f. & Th. Ind. Fl. i. 80.—A large woody climber, all softer parts brownish puberulous; leaves oblong, shortly and almost bristly acuminate, on a strong puberulous petiole 3-4 lin. long, rounded at base, 4-6 in. long, coriaceous, beneath shortly puberulous all over; flowers rather small, about ½ in. long or longer, on an in. long, tawny-velvety, pedicel, 1-bracted at the middle, almost umbellate from a very short peduncle; sepals ovate, acute; outer petals tawny-velvety, ovate-oblong, rather obtuse; berries an in. or more thick, on a strong stalk of similar length, almost globular, verrucose-wrinkled, tawny-velvety, glabrescent.

HAB.—Ava, Kakhyen hills.—Fl. Apr.

5. **M. bicolor,** H. f. & Th. Ind. Fl. i. 80.—An evergreen scandent shrub, the younger parts shortly tawny pubescent; leaves oblong to oblong-lanceolate, on a pubescent petiole ¼-⅓ in. long, obtuse at

base, 4-6 in. long, blunt or acute, almost chartaceous, the midrib and the whole under-surface tawny pubescent; flowers solitary or by 2-4 fascicled, about 1 in. long, on an 1-1½ in. long densely tomentose bracted pedicel; sepals ovate, villous; outer petals ovate-lanceolate, densely tawny villous outside and less so along the margins inside; the inner ones shorter and narrower, glabrous, or sparingly villous outside; berries globular, about an in. thick, on a thick ¼-⅓ in. long stalk, tomentose.

Hab.—Rare in the tropical forests of the western slopes of the Prome Yomah; Ava.

MITREPHORA, Bl.

Sepals 3, orbicular or ovate. Petals 6, in 2 rows, valvate, the outer ones free and spreading, the inner ones clawed and cohering with their blades into a mitre. Stamens oblong-cuneate, the connective truncate-capitate. Ovaries many, with many ovules in each, attached to the suture in 1 or 2 rows; style oblong. Berries stalked.—Trees or shrubs, with often rather conspicuous flowers.

* *Flowers dioecious, about* 3 *lin. long.*

Leaves (except nerves beneath) glabrous; inflorescence and petals tomentose . . . . . *M. reticulata.*

* * *Flowers conspicuous,* 1-2 *in. in diameter.*

Leaves softly tomentose beneath; flowers 2 in. across, on short and thick pedicels . . . . . *M. tomentosa.*

Leaves minutely puberulous or almost glabrous; flowers about an in. across, on long slender pedicels . . . . . *M. vandæflora.*

1. **M. reticulata,** H. f. & Th. Ind. Fl. i. 77.—A small tree, the younger parts puberulous; leaves oblong or oblong-lanceolate, 6-7 in. long, usually unequal at the obtuse or acute base, on a short tomentose petiole, apiculate or bluntish acuminate, coriaceous, puberulous along the nerves beneath; flowers small, about 3 lin. long, dioecious, greenish, on slender about an in. long greyish tomentose pedicels clustered above the scars of the fallen leaves or in the axils of the leaves; sepals and outer petals broadly ovate, tomentose; inner petals on long claws, tomentose, the lamina forming a short mitre; berries globular.

Hab.—Tenasserim.

2. **M. tomentosa,** H. f. & Th. Ind. Fl. i. 76.—A tree, the branchlets and younger parts tawny tomentose; leaves oblong or ovate-oblong, 6-7 in. long, rounded at base, coriaceous, acuminate, acute, or almost blunt, the midrib and whole under-surface softly tawny tomentose; flowers about 2 in. in diameter, on a 3 to 6 lin. long, thick, tawny tomentose pedicel bracted above the middle, forming a poor 2-4-flowered cyme on a very short leaf-opposed tomentose peduncle; sepals broadly ovate, acute, densely

tawny tomentose; petals tawny tomentose outside, the outer ones nearly an in. long, ovate, acute, parallel-veined, the inner ones narrowed in a broad claw, the lamina broadly ovate; berries ovoid or almost globular, the size of a bullet, tawny tomentose, on a 1-1½ in. long stalk.

Hab.—Chittagong; rare along choungs in the tropical forests of the central parts of the Pegu Yomah.—s.—SS. = SiS.

3. **M. vandæflora**, Kz.—A tree (40—60 + 20—25 + 3—5) shedding leaves in the HS., the younger parts and branchlets tawny pubescent; bark dark-brown, about ⅓ in. thick, longitudinally zonate, rather smooth; cut pale, dry; leaves oblong or ovate-oblong to elliptical, 5-6 in. long, on a short puberulous petiole, rounded or acute at base, chartaceous or almost coriaceous, acuminate or acute, either minutely puberulous on both sides or glossy above and minutely puberulous along the nerves beneath; flowers rather conspicuous, more than an in. in diameter, arising from reduced lateral much scared and thick peduncles, usually by pairs or several, on an about an in. long upwards thickened tawny tomentose pedicel furnished below the calyx with a half-stem-clasping rounded bract; sepals rotundate, densely tawny pubescent; the 3 outer petals linear-oblong, waved, slightly tawny pubescent outside, yellow, reddish-striped, the inner ones connivent with the claws short and broad, puberulous outside, tomentose along the borders, yellow, white and red-dotted at the tip.

Var. 1. **vandæflora proper**: leaves narrower and long-acuminate, of a thicker texture, shortly pubescent on both sides, but more so beneath, opaque; petals uniformly pale-yellow.

Var. 2. **chartacea**: leaves broader, apiculate to bluntish, thin papery, glabrous, at least above; petals yellow, reddish-striped.—(Very near to *M. obtusa*.)

Hab.—Tropical forests; rare on the Pegu Yomah; frequent in Martaban up to 2,000 ft. elevation; also Chittagong—Fl. Feb.—March.—s.—SS. = Metam, SiS.

Remarks.—Wood light-brown, perishable.

ANONA, L.

Sepals 3, valvate. Petals usually 6, valvate, in 2 series, the outer ones fleshy, connivent or almost spreading, the inner ones almost conform, but somewhat smaller, rarely wanting. Stamens numerous, the connective beyond the anther-cells ovate. Torus hemispherical. Ovaries numerous, usually united, with a solitary ovule in each; style oblong. Berries fleshy, connate into a many-

celled oval or globular fruit.—Trees or shrubs, of American origin, with solitary, terminal, or leaf-opposed flowers.

* *Fruits areolate.*
Leaves usually blunt; fruit with prominent convex areoles . *A. squamosa.*
Leaves acuminate, larger, areoles of fruit not or hardly projecting . . . . . *A. reticulata.*
** *Fruits very large, muricate; all parts glabrous* . *A. muricata.*

1. **A. squamosa,** L.; H. f. Ind. Fl. i. 78; Brand. For. Fl. 6.—A small tree, up to 20 feet high, leafless in the HS., the young shoots slightly pubescent; leaves oblong or oblong-lanceolate, usually blunt, while young pubescent, soon turning glabrous; peduncles 1-flowered, usually solitary; flowers yellowish-green; exterior petals narrow-lanceolate, blunt, concave at base, 3-sided near the apex, connivent; inner ones scarcely any; fruit ovoid, the size of a child's fist, glaucous green, with prominent convex areoles.

Hab.—Cultivated all over Burma; on a large scale planted in the Prome District.—Fl. March; Fr. R. S.—l.—SS. = ∞ *CaS.*

2. **A. reticulata,** L.; H. f. Ind. Fl. i. 78.—*Aw-za.*—A small tree, up to 25 ft. high, leafless in the HS.; leaves oblong-lanceolate, acuminate, glabrous, minutely pellucid-dotted; peduncles lateral, mostly by 2-4 together; flowers yellowish-green; exterior petals oblong, connivent, 3-sided towards the apex, convex below, the inner ones minute, smaller than the calyx, blunt; fruit irregularly globose, umbilicate at base, areolate, the areoles 5-angular, flat, not or hardly projecting.

Hab.—Here and there cultivated in native gardens and villages of Pegu and Tenasserim.—Fl. H. S.; Fr. R. S.—s.

3. **A. muricata,** L.—An evergreen small tree, all parts glabrous; leaves ovate-lanceolate, acute or apiculate, glabrous; flowers yellowish green, solitary or by pairs, on axillary peduncles; the outer petals cordate, acuminate, the inner ones blunt; fruits green, varying in size from ½ to 2 ft. length, covered by appressed fleshy thick prickles.

Hab.—Cultivated in villages of Tenasserim.—Fr. Close of R. S.—s.

MILIUSA, Lesch.

Flowers usually dioecious. Sepals 3, minute, valvate, usually reflexed. Petals 6, valvate, in 2 series, the outer ones minute and almost conform with the sepals, the inner ones much longer, erect-connivent, sometimes cohering. Stamens few or numerous, the connective hardly apiculate. Torus cylindrical. Ovaries numerous, with 1 or 2, rarely more ventral ovules in each; style oblong. Berries globular or oblong.—Trees, with solitary or clustered flowers.

* *Pedicels 2—4 in. long, without or with a rudimentary bractlet.*

Tomentose; berries tomentose, shortly stalked . . . . *M. velutina.*

* * *Pedicels short, only 6-10 lin. long.*

Branchlets and leaves beneath rusty pubescent; flowers about ½ in. long; pedicels bracted . . . . . *M. Roxburghiana.*

Leaves glabrous; flowers nearly an in. long; pedicels bracted . *M. tristis.*

Almost glabrous; pedicels without bract . . . . . *M. sclerocarpa.*

1. **M. velutina,** H. f. & Th. Ind. Fl. i. 87; Bedd. Sylv. Madr. t. 37; Brand. For. Fl. 6, t. 2.—*Tha-bwot-kyee.*—A tree (40—50+ 10—15 + 3—5) shedding leaves in the HS., all softer parts greyish pubescent or tomentose; bark about an in. thick, longitudinally fissured, blackish; leaves ovate to elliptical, on a short, thick, tomentose petiole, very variable in size, usually 6-9 in. long, rounded or cordate at base, apiculate, acute, or almost blunt, shortly greyish tomentose, above less so, or velvety; flowers about 4 to 5 lin. long, on slender 2-3 in. long densely tomentose bractless pedicels, arising solitary or by pairs from a simple or branched tomentose peduncle; sepals ovate, minute, densely tomentose; the outer petals conform with the sepals, the inner ones broadly ovate, about 3-4 lin. long, densely tomentose outside, blackish-purple and glabrous inside; berries about ½ in. in diameter, ovoid to oblong, on a short but rather slender stalk, puberulous.

Hab.—Low forests and lower mixed forest, rarely in the upper ones; Ava; common in Pegu, but rare in Martaban and Tenasserim.—Fl. H. S.; Fr. R. S.—1.—SS. = ∞ *Lat. p., Arg.*

Remarks.—Wood grey, soft, rather heavy, fibrous, but close-grained. Used for poles of carts and harrows, yokes, spear-shafts, oars, &c. W = □^{1} = 42 pd.

2. **M. Roxburghiana,** H. f. & Th. Ind. Fl. i. 87.—A small shrubby tree, the branchlets and younger parts brownish tomentose; leaves variable in shape and size, usually oblong to oblong and ovate-lanceolate, 3-5 in. long, on a very short tomentose petiole, obtuse or acute at base, abruptly acuminate, apiculate, or long-acuminate, chartaceous, softly pubescent beneath; flowers dioecious, drooping, about ½ in. long, axillary, solitary, or sometimes fascicled, on an about ½ in. long densely tawny tomentose pedicel thickened upwards and furnished with 1-3 linear-lanceolate tomentose bractlets; sepals and 3 outer petals almost conform, linear, rusty-tomentose; the 3 inner petals 5-6 lin. long, oblong-lanceolate, somewhat acute, red; torus hemispherical, tomentose; berries ovoid or oblong, on a slender stalk ¾-1 in. long, glabrous, granulate, the size of a large pea.

Hab.—Chittagong; Tenasserim.

3. **M. tristis,** Kz.—An evergreen tree, the shoots tawny puberulous; leaves ample, oblong, on a 1-2 lin. long puberulous petiole,

abruptly acuminate, acute and somewhat oblique at base, chartaceous, glabrous, or minutely and sparingly puberulous on the lax net-venation beneath; flowers solitary, axillary, and leaf-opposed, on a tawny pubescent 1-bracted pedicel ½ in. long; calyx and corolla appressed tawny pubescent; sepals ovate-subulate, about 2 lin. long; outer petals twice so long, lanceolate, acuminate, the inner ones ¾-1 in. long, oblong, bluntish.

Hab.—Ava, Kakhyen hills.—Fl. March.

4. **M. sclerocarpa,** Kz.—A trêe (40—50 + 15—35 + 3—5), shedding leaves in the HS., the young shoots thinly appressed silky; bark rather thin, smooth, longitudinally striate; leaves oblong or elliptically oblong, on a rather short petiole, acute at base, apiculate, chartaceous or thin coriaceous, glabrous; flowers dioecious, 7-8 lin. long, yellowish, on 3-4 lin. long slender pubescent bractless pedicels, fascicled or rarely singly on the very shortened axillary peduncle; sepals and petals almost conform, short, linear-lanceolate, tawny tomentose; inner petals 7-8 lin. long, lanceolate, blunt, puberulous outside, greyish tomentose inside; stamens numerous, closely packed on the almost globular torus.

Hab.—Not unfrequent in the upper mixed forests of the Martaban hills, entering also the dry hill forests at 2,000—3,000 ft. elevation; also Tenasserim.—Fl. March.—l.—SS. = Metam.

Remarks.—Wood rather heavy, fibrous, but close-grained, soft, yellowish, turning brownish.

ALPHONSEA, Hf. & Th.

Sepals 3, small, valvate. Petals valvate, in 2 series, larger than the sepals, equal, or the inner rather smaller. Torus cylindrical or hemispherical. Stamens numerous, loosely packed, the connective apiculate. Ovaries 1 or more, with 4-8 ventral ovules in 2 rows in each; style oblong or depressed. Berries stalked or nearly sessile. Trees with coriaceous leaves. Flowers rather small, in leaf-opposed peduncled fascicles.

Carpel as long or longer than the stalk . . . . . *A. ventricosa.*
Stalk of carpels very short . . . . . *A. lutea.*

1. **A. ventricosa,** H. f. & Th. Ind. Fl. i. 89.—A large tree, the shoots rusty-tomentose; leaves oblong or oblong-lanceolate, about 6-10 in. long, rounded at base, on a short, thick, puberulous petiole, shortly and bluntish acuminate, coriaceous, shining above, glabrous with the exception of the pubescent midrib; peduncles very short or reduced; flowers greenish white, odorous, on ½-1 in. long tawny tomentose pedicels 1-bracted at base and bearing a scale-like bractlet at their middle; sepals pubescent outside; petals 8-9 lin. long, tawny tomentose, almost trapezoid, saccate at base; style oblong;

berries ovoid or almost globular, velvety, about 1½ in. thick, on a stalk nearly an in. long.

Hab.—Forests of Chittagong; also Andamans.

2. **A. lutea,** H.f. & Th. Ind. Fl. i. 89; Bedd. Sylv. Madr.10.—A large tree, the leaf-buds tawny tomentose; leaves oval-oblong, rounded at base, on a short, thick petiole, bluntish acuminate, coriaceous, glabrous, while young puberulous along the midrib, glossy above, pale-coloured beneath; flowers about an in. in diameter, on a very short tawny tomentose pedicel, forming sessile or shortly peduncled leaf-opposed clusters; sepals roundish; petals ovate, the outer ones somewhat larger; style oval; berries oval, about 1-1½ in. long, on very short stalks, tawny puberulous, yellowish.

Hab.—Ava.

OROPHEA, Bl.

Sepals 3, valvate. Petals 6, valvate, in 2 series, the inner ones clawed and cohering with their tips into a mitre-shaped cap. Stamens 6-12, ovoid, fleshy; the anther-cells dorsal, large, contiguous. Ovaries 3-15, with 4 ovules in each; style short or none. Berries 1- or few-seeded.—Trees or shrubs, with usually small axillary flowers, solitary, fascicled, or cymose.

* *Flowers hardly* 2-3 *lin. in diameter.*

Leaves glabrous; sepals minutely hispid, ciliate; carpels globular, stalked . . . . . *O. polycarpa.*

Leaves on the nerves pubescent; sepals densely pubescent; carpels elongate, oblong, sessile . . . . . *O. hexandra.*

* * *Flowers about an in. in diameter*; leaves pubescent beneath . . . . . *O. Brandisii.*

1. **O. polycarpa,** DC.; H.f. Ind. Fl. i. 91.—A large shrub or small tree, the shoots more or less pubescent; leaves obovate or oblong, 3—4 in. long, very shortly petioled, obtuse at base, bluntish acuminate, chartaceous or almost coriaceous, glabrous, glossy above; flowers about 2 lin. in diameter, on ½ in. long curved glabrous pedicels, arising from short or long and filiform glabrous or puberulous axillary peduncles; sepals broad, almost blunt, minutely appressed hispid, ciliate; petals tomentose on the margins, the outer ones broadly ovate, blunt; stamens 6; berries the size and shape of a pea, on a slender stalk 2 lin. long, glabrous, 1-seeded.

Hab.—Rather frequent in the tropical forests of the Andamans; also Martaban and Tenasserim.—Fl. March; Fr. June.—s.—SS. = Metam., SiS.

2. **O. hexandra,** Bl. (*O. acuminata,* DC.; H.f. Ind. Fl. i. 91.)—A shrub or small tree, the branches and young parts tawny pubescent; leaves oblong- or ovate-lanceolate, obtuse at base, on a very short puberulous petiole, acuminate or cuspidate, 4-6 in. long,

chartaceous, pubescent on the nerves beneath; flowers about 3 lin. in diameter, greenish white with a tinge of rose, on ½ in. long pubescent pedicels, arising from nearly as long lateral or supra-axillary pubescent peduncles; sepals oblong, acute, densely pubescent outside; outer petals cordate-ovate, acuminate, pubescent; stamens 6; ovaries 3-6, pubescent; berries elongate-oblong, almost sessile, cylindrical, acuminate.

Hab.—Tenasserim.

3. **O. Brandisii,** H.f. & Th. Ind. Fl. i. 92.—An evergreen tree (20—25 + 10—12 + 1—1½), the younger parts pubescent; bark about a line thick, rather smooth, blackish; cut pale coloured; leaves obovate-oblong to elliptically oblong, on a very short tawny tomentose petiole, usually somewhat narrowed towards the rounded base, shortly acuminate, 5-6 in. long, membranous, beneath pubescent and on the nerves tawny tomentose; flowers about an in. in diameter, on strong c. ½ in. long pubescent pedicels, arising from a rather short tomentose supra-axillary peduncle; sepals ovate-lanceolate, acuminate, spreading, pubescent; outer petals broadly ovate, acute, spreading, pubescent, greenish, the inner ones connivent, yellow, turning reddish; unripe carpels densely pubescent, oblong, sessile, 1-seeded.

Hab.—Not unfrequent in the tropical forests of Martaban, especially along streamlets; also Tenasserim.—Fl. Apr.-May.—s.—SS. = Metam.

Remarks.—Wood rather light, fibrous, but close-grained, pale-coloured and dotted.

BOCAGEA, St. Hil.

Sepals orbicular or ovate, imbricate. Petals 6, imbricate, in 2 series, nearly equal, concave. Stamens 6-21, imbricate, in 2 or more series, broadly oblong, thick-fleshy; the connective produced beyond the dorsal oblong anther-cells. Ovaries 3-6, with 1 or 2-8 ventral ovules in each; style short; stigma obtuse or capitate. Berries globose, stalked.—Trees, with shining leaves and small flowers.

1. **B. elliptica,** H.f. & Th. Ind. Fl. i. 92.—A large evergreen tree, all parts glabrous; leaves linear-oblong, 8-10 in. long, obtuse at base, on a short thick petiole, acute or blunt, coriaceous, almost polished; flowers small, axillary or arising from above the scars of the fallen leaves of the older branchlets, solitary or fascicled, on very short pedicels scaly at base and furnished with a rounded bractlet at about the middle; sepals membranous-bordered, ciliate; petals broadly oval, ciliate, ¼ in. long; stamens 12; berries globular, about an in. thick, smooth, very shortly stalked.

Hab.—Tenasserim.

ACC NO.....3268

MENISPERMACEÆ.

Flowers dioecious. Sepals usually 6, rarely 1-4 or 9-12, usually free, in 2 to 4 series. Petals 6, rarely 1-5 or none, free or connate. Males: stamens hypogynous; filaments and anthers free or connate, the latter 2-celled; ovaries rudimentary or none. Females: staminodes 6 or none. Ovaries 3, rarely 1 or 6-12, with a solitary or rarely 2 ovules in each; style terminal or lateral. Ripe carpels drupaceous, with an almost basal or excentrical style-scar. Seeds usually curved or reniform, the endocarp often intruding. Albumen even or ruminate, or none. Cotyledons fleshy or leafy.—Herbs or shrubs, twining or scandent, with usually palmately nerved alternate leaves. Stipules none. Flowers minute, variously arranged.

Active narcotic and bitter principles prevail in this order, and the juice of *Tinospora* is, therefore, often used as a febrifuge. About 21 species are found in Burma, but only few of these are really woody and of any concern to the forester. The structure of the wood of these is peculiar and interesting.

* *Ovaries usually* 3. *Seeds oblong or almost globular.*

Style-scar terminal or nearly so; petals 6 . . . . . *Tinospora.*
As former, petals none . . . . . *Fibraurea.*
Style-scar almost basal; filaments all connate . . . . *Anamirta.*

* * *Seeds horse-shoe-shaped or otherwise curved.*

○ Albumen copious.

Petals 6, minute; ovaries 3-12; style subulate . . . . *Tiliacora.*
Petals 5-8; ovaries 3; style compressed . . . . . *Limacia.*
Petals 6; ovaries 3-6; style subulate . . . . . *Cocculus.*

○ ○ Albumen none.

Sepals, petals, and stamens, 6 each; flowers racemose or spiked . *Pachygone.*
As preceding, but 9 stamens; flowers clustered . . . . *Pycnarrhena.*
Petals 2; sepals 8; stamens 4; flowers clustered . . . . *Antitaxis.*

TINOSPORA, Miers.

Sepals 6, in 2 series, the inner ones larger. Petals 6, smaller than the sepals. Males: stamens 6, free. Females: staminodes 6, club-shaped. Ovaries 3, the stigmas forked. Drupes 3-1, flat, with convex back, the style-scar almost terminal. Putamen tubercled, dorsally keeled, intruding. Albumen ruminate. Cotyledons leafy, spreading.—Climbing shrubs, with woody or fleshy-fibrous stems. Flowers in racemes or panicles.

* *Drupes the size of a pea, the putamen tubercled.*

Young parts and the blunt leaves beneath tomentose . . . *T. tomentosa.*
Young parts and the acuminate leaves beneath pubescent . . *T. Malabarica.*
All parts glabrous . . . . . *T. crispa.*

* * *Putamen smooth, white.*

All parts glabrous; drupes the size of a pea . . . . . *T. cordifolia.*
Young leaves and shoots pubescent or tomentose; drupes the size of a cherry . . . . . *T. nudiflora.*

1. **T. tomentosa,** Miers; H.f. Ind. Fl. i. 96.—A high climber, the younger parts shortly tomentose; bark grey, minutely granular tubercled; leaves rotundate-cordate, repand or sometimes more or less 3-lobed, especially beneath tomentose, 3 to 6 in. long and almost as broad, on tomentose petioles nearly as long; racemes solitary or clustered, usually simple, the flowers clustered in the axils of the minute deciduous bracts; drupes 1-3, the size and shape of a large pea, smooth, orange-coloured, containing a tubercled putamen.

Hab.—Ava.

2. **T. Malabarica,** Miers; H.f. Ind. Fl. i. 96.—A scandent shrub, the younger parts whitish pilose; leaves cordate-ovate, acuminate, 3-6 in. long and almost as broad, on a pilose petiole nearly as long, 7-nerved, above roughish, beneath woolly or pubescent; racemes as long as the leaves; flowers green; drupes coral-red, the size of a pea, containing a tubercled putamen.

Hab.—Chittagong.

3. **T. crispa,** Miers; H.f. Ind. Fl. i. 96.—A large climber, all parts glabrous, the stems grey, terete, warted; leaves oval-oblong, acuminate, slightly cordate at base, entire or repand, 2-6 in. long by 1-4 broad, on a ⅔-2 in. long petiole, glabrous; racemes solitary or clustered above the scars of the fallen leaves, 4-8 in. long; flowers by 2 or 3 in the axil of an oval fleshy bract, pedicelled, yellowish green; drupes yellowish or pale orange-coloured, the size of an olive; putamen tubercled (accord. Miers).

Hab.—Pegu; Arracan.

4. **T. cordifolia,** Miers; H.f. Ind. Fl. i. 97; Brand. For. Fl. 8.—A large climber, all parts glabrous; bark sparingly corky-warted; leaves broadly cordate, acute or shortly acuminate, 2-4 in. long and broad, on petioles nearly equally long, glabrous; racemes axillary, rarely terminal or arising singly from above the scars of the fallen leaves, simple or branched at base; bracts subulate, the lower ones occasionally almost leafy; flowers yellowish green, the males fascicled, the females usually solitary, glabrous; drupes the size of a pea, glossy, red, containing a smooth keeled putamen.

Hab.—Not unfrequent in the forests of the Andaman Islands; Chittagong, Ava.

5. **T. nudiflora,** Kz.—*Sin-dong-ma-nway.*—A large scandent shrub, leafless in HS, the younger parts densely and almost whitish tomentose, stems terete, sparingly beset with small pustules or warts, or corky-lenticellate; young leaves on long pubescent petioles, ovate-oblong, rounded or slightly sinuate at base, shortly and sharply acuminate, softly (beneath whitish) pubescent; female flowers brownish yellow, solitary, on a slender pedicel from the axil of a small subu-

late bract, forming 3-4 in. long, glabrous, solitary racemes above the scars of the fallen leaves; drupes as large as a cherry or nearly an in. thick, orange yellow, smooth and shining; the putamen white, about 5-6 lin. long, smoothish, imbedded in a limpid, colourless, jelly-like juice.

Hab.—Rather frequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban; also Tenasserim:—Fl. March-Apr.; Fr. Begin. of R. S.—s: l.—SS.=SiS.; Metam.

Remarks.—Wood consisting of coarse brown and white variegated strong loosely arranged fibres. Possibly good for cordage.

FIBRAUREA, Lour.

Sepals 9, the 3 outer ones small and bract-like. Petals none. Males: stamens 6. Females: staminodes 6; ovaries 3, with 2 ovules in each; stigma minute, sessile. Drupes 3, 1-seeded, the style-scar almost terminal. Putamen oblong, with convex back, the endocarp hardly intruded. Albumen horny. Cotyledons leafy.—Woody climbers, with coriaceous 3-nerved leaves. Flowers in axillary panicles.

1. **F. tinctoria,** Lour; H.f. Ind. Fl. i. 98.—A large woody climber, all parts glabrous; leaves ovate to elliptically oblong, rounded at base, on a 1-2 in. long petiole, shortly and bluntish acuminate or apiculate, quite glabrous, glossy, coriaceous; panicles glabrous, lax, the male ones hardly, the female ones 5-6 times, longer than the petioles; flowers rather small, on slender glabrous pedicels; drupes nearly an in. in diameter, yellowish, smooth and glossy.

Hab.—Tenasserim.

ANAMIRTA, Colebr.

Sepals 6, somewhat unequal. Petals none. Males: filaments united in a column bearing numerous sessile anthers which are 4-lobed and 4-celled after dehiscence. Females: staminodes 9-10; carpels 3, rarely 4-5, the stigmas almost capitate. Drupes stalked, the style-scar almost basal; putamen woody, the hollow endocarp-process intruding near the base. Seeds globular, hollow. Albumen almost ruminate. Cotyledons narrow.—Woody climbers, with large leaves. Flowers in large pendulous panicles.

1. **A. cocculus,** W.A.; H.f. Ind. Fl. i. 98; Brand. For. Fl. 8.—A large woody climber, all parts glabrous; bark grey, corky-rimose; leaves ovate or broadly ovate, cordate or truncate and 3-nerved at base, acute or acuminate, rarely bluntish, on 2-6 in. long petioles, glabrous above, beneath pale-coloured and with a tuft of hairs in the nerve-axils, 4-8 in. long and about so broad or narrower; panicles

pendulous from the older branches, 1-1½ ft. long, ramified, the ramifications 1-2 in. long, many-flowered; flowers yellow, glabrous, nearly 3 lin. in diameter; sepals deciduous; drupes glabrous, ⅔ in. long, obliquely oval, on ½ in. long stalk, purplish black.

Hab.—Tenasserim.—Fl. Febr.

TILIACORA, Colebr.

Sepals 6, the outer ones small, hardly imbricate in bud. Petals 6, minute. Males: stamens 6, free. Females: carpels 9-12, the styles short and subulate. Drupes stalked (the stalks connate at base), the style-scar near the base; putamen sulcate. Seed hooked. Albumen oily, ruminate. Cotyledons fleshy, appressed.—Woody climbers, with axillary panicles.

1. **T. racemosa,** Colebr.; H.f. Ind. Fl. i. 99; Brand. For. Fl. 10.— An evergreen woody climber, all parts glabrous; leaves ovate, petioled, usually truncate at base, acuminate, of a rather firm texture, much netveined, glabrous; panicles axillary, commonly shorter than the leaves; flowers small, yellow; drupes many, shortly stalked, red and shining.

Hab.—Pegu.

LIMACIA, Lour.

Sepals 6, the inner larger ones valvate or slightly imbricate in bud. Petals 6, shorter than the sepals, embracing the stamens. Males: stamens 3, 6 or 9, free. Females: staminodes 6; carpels 3, with short compressed style. Drupes obovate or kidney-shaped, the style-scar almost basal. Putamen 3-celled, the 2 lateral cells empty. Seed elongate, embracing the intruded endocarp. Albumen even. Cotyledons elongate, half-terete, appressed.—Woody climbers with panicled flowers.

* *Sepals* 8-12, *of a thin texture, the inner ones imbricate* . *L. cuspidata.*
* * *Sepals* 9, *thick, valvate.*
Stamens 3; adult leaves glabrous . . . . . *L. triandra.*
Stamens 6; branches and leaves beneath velvety tomentose . . *L. velutina.*

1. **L. cuspidata,** H.f. & Th. Ind. Fl. i. 100.—A large woody evergreen climber, the younger parts pubescent; leaves ovate or oblong-lanceolate, rounded or almost cuneate at base, on a ½-1 in. long pubescent petiole, 3-nerved, acuminate, glossy, much netveined, 2-3 (those of the shoots often 5-6) in. long; panicles pubescent, axillary or almost supra-axillary, solitary, or by pairs, arising from a tomentose tubercle, the male ones twice as long as the petioles and almost raceme-like, the female ones reduced and few-flowered; bracts minute, subulate; stamens 8-12; drupes almost globular, hardly ½ in. long.

Hab.—Tenasserim.

2. **L. triandra,** Miers; H.f. Ind. Fl. i. 100.—A climber or twiner, the younger branchlets puberulous; leaves oblong-lanceolate, 2-4 in. long, rounded at base, on a puberulous petiole ½ in. long, acute or acuminate with a mucro, glabrous, much netveined; panicles raceme-like, puberulous, shorter than the leaf, the ramifications short, 3-5-flowered; flowers minute, yellowish; petals narrow-obovate, entire; stamens 3; filaments fleshy, cuneate-oblong.

HAB.—Prome; Tenasserim.

3. **L. velutina,** Miers; H.f. Ind. Fl. i. 100.—A woody climber, the younger parts yellowish or tawny tomentose; leaves from oblong and oval-oblong to lanceolate, variable, rounded or acute and sometimes oblique at the 3-nerved base, on a densely tawny pubescent petiole ½-1¼ in. long, acute, with a mucro or blunt to almost rounded, 2-4 in. long, when young on both sides densely tawny pubescent, glabrescent above; panicles axillary or nearly so, solitary or few together, almost shorter than the petiole, or arising from leafless shoots, tawny tomentose, few-flowered; bracts scale-like; flowers dark-brown-villous; the inner sepals glabrous inside, valvate; petals obovate-spatulate, notched or truncate; drupes obovate, 1 in. long, glabrous.

HAB.—Tenasserim.

COCCULUS, DC.

Sepals 6, the inner ones larger. Petals 6, shorter than the sepals, entire or 2-cleft. Males: stamens 6, free; the anthers didymous or 4-lobed, or almost 4-celled. Females: staminodes 6 or none; carpels 3, the style linear, recurved or reflexed. Drupe obovate or globular, laterally compressed, the style-scar almost basal. Putamen tubercled on the back, horse-shoe-shaped, often perforated at base. Seed curved. Albumen fleshy. Cotyledons linear, appressed.—Usually climbing shrubs or herbs, rarely erect or nearly so, with panicled flowers.

1. **C. glaucescens,** Bl. (*C. macrocarpus,* WA.; H.f. Ind. Fl. i. 101).—A large woody climber, all parts glabrous, the stems 1-1½ in. thick; bark thin, smooth, silvery grey; leaves reniform or rotundate, on a slender glabrous petiole 3-2 in. long, truncate or rounded (while young somewhat peltate) at the 5-nerved base, notched or blunt with a mucro, somewhat repand, quite glabrous, beneath glaucescent, c. 4 in. broad or broader; panicles arising usually from the older branches, rarely axillary, not seldom 1 ft. long, many-flowered; petals 3-lobed, embracing the stamens; drupes obversely ovoid-oblong, 1 in. long; the putamen thin, woody, laterally furrowed.

Hab.—Not unfrequent in the tropical forests along the eastern slopes of the Pegu Yomah and Martaban down to Tenasserim.

Remarks.—Wood rather heavy, but porose, grey, with broad annual rings.

PACHYGONE, Miers.

Sepals 6, the inner ones larger. Petals as many, embracing the stamens. Males: stamens 6, free; anthers nearly globular, 2-celled. Females: staminodes 6. Carpels 3, with horizontal styles. Drupes kidney-shaped, the style-scar nearly basal. Putamen conform, wrinkled. Seed horse-shoe-shaped. Albumen none. Cotyledons very thick, half-cylindric.—Woody climbers, with racemose flowers.

Inflorescence and drupes densely tomentose; nervation of leaves prominent . . . . . *P. dasycarpa.*
Inflorescence glabrous; leaves almost polished . . . . *P. odorifera.*

1. **P. dasycarpa,** Kz.—An evergreen scandent shrub, the branchlets and young parts tomentose; leaves oval, 1½-2 in. long, on a shortly tomentose slender petiole ⅓-1 in. long, bluntish or rarely retuse, minutely mucronate, coriaceous, quite glabrous, glossy, the elegant nervation and netveination prominent; racemes and pedicels (in fruit) stout, yellowish tomentose; drupes obliquely oboval, densely yellowish or greyish tomentose, the size of a large pea.

Hab.—Tenasserim, Moulmein District; also adjoining Siamese province of Kanbooree.—Fr.-May.—Ca.

2. **P. odorifera,** Miers.—*Nga-phyoo.*—An evergreen powerful woody climber, the young shoots sparingly appressed tawny pubescent, the branchlets terete, glabrous, pendulous; leaves oblong, on a slender glabrous petiole 6-9 lin. long, rather obtuse or rounded at the 3-5-nerved base, 2½-4 in. long, bluntish, with a callose mucro, quite glabrous, and almost polished on both sides, the reticulation, &c., almost immersed; flowers small, white, honey-scented, on rather long pedicels, forming a puberulous slender raceme of about the length of the leaves; petals and sepals glabrous; drupes the size of a large pea, about 5 lin. long, containing a kidney-shaped, compressed, spinulose-tubercled putamen.

Hab.—Common in the swamp forests of the alluvial plains of Prome, Pegu, and Martaban; also Tenasserim (here on limestone rocks).—SS. = *All.*, Ca?

PYCNARRHENA, Miers.

Flowers dioecious. Males: sepals 6, with 3 bracts, the inner ones larger and orbicular; petals 6, small, lobed. Stamens 9, the filaments very short; anthers bursting transversely. Female flowers unknown. Drupe broadly oblong, with the scar of the style lateral, the endocarp almost kidney-shaped. Albumen none. Cotyledon

half-terete, very thick, slightly curved, the radicle minute.—Shrubs, usually scandent, with fascicled or shortly panicled small flowers.

1. **P. pleniflora,** Miers; H.f. & Ind. Fl. i. 106.—An evergreen large scandent shrub, all parts glabrous, or the branchlets puberulous; leaves oblong-lanceolate, on a $\frac{3}{4}$ to an in. long petiole thickened at the apex, 5-7 in. long, coriaceous, bluntish acuminate, glabrous or puberulous on the midrib beneath, strongly netveined; flowers minute, almost capitate, the peduncles 2-3 lin. long, puberulous, 1-2-flowered; drupes broadly oblong, $\frac{1}{2}$ in. long, glabrous.

Hab.—Ava, Kakhyen hills.

ANTITAXIS, Miers.

Flowers dioecious. Males: sepals 8, in decussate pairs, the outer ones small, the 4 inner ones larger and imbricate. Petals 2, obovate. Stamens 4; filaments club-shaped; anthers 1-celled, opening transversely. Females unknown. Drupes 1-3, almost globose, with a ventral style-scar, the endocarp crustaceous, almost reniform-oblong. Seeds nearly globose, concave on the inner face. Albumen none. Cotyledon half-terete, oblong, slightly curved, the radicle minute.

1. **A. calocarpa,** Kz.—An evergreen large woody climber, the leaf-buds minutely brown-tomentose; leaves oblong, on a minutely pubescent glabrescent petiole $\frac{1}{2}$-$\frac{3}{4}$ in. long, acute or obtuse at the base, 4-6 in. long, acuminate, thin chartaceous, elegantly netveined, the lateral nerves strongly anastomosing towards the margin; flowers (males) small, on slender appressed hispid 2-3 lin. long pedicels, numerous, forming small clusters arising from tomentose tubercles from above the scars of the fallen leaves; drupes globular, the size of a cherry, smooth, scarlet, on glabrous peduncles about $\frac{1}{2}$ in. long.

Hab.—Tropical forests of the Chittagong hills.

BERBERIDEÆ.

Flowers regular. Sepals 6 or 4, in 2 whorls, or 3, and petaloid. Petals as many or twice as many, rarely wanting. Stamens 4-9. in 2 or 3 series, opposite the petals, hypogynous; anther-cells opening by a longitudinal slit or by recurved valves. Carpels 1-3, rarely more, with 2 or several (rarely a single) ovule in each; style short. Ripe carpels dry or fleshy, dehiscent or not. Albumen copious. Embryo minute or long, the radicle next the hilum.—Shrubs or small trees, rarely climbing, with scaly bud and simple or compound leaves. Stipules usually none.

A small family, of which only a single species occurs in Burma. The berries of the berberry are acid and astringent. The bark of

some species is astringent and used by dyers. Yellow dye is obtained from the wood of several species.

BERBERIS, L.

Flowers hermaphrodite. Sepals 6, with 2 or 3 appressed bracts, imbricate, in 2 series. Petals as many, imbricate. Stamens 6, free; anther-cells opening by valves. Ovary 1-celled with a few basal ovules. Fruit a few-seeded berry.—Erect shrubs or small trees, with pinnate or fascicled simple leaves. Flowers yellow, usually in racemes.

1. **B. Nepalensis,** Spreng.; H.f. Ind. Fl. i. 109; Bedd. Sylv. Madr. 12; Brand. For. Fl. 12.—An evergreen almost simple shrub, 3-6 feet high, all parts glabrous; leaves unpaired-pinnate, ½-1½ ft. long, the leaflets in 6 to 10 pairs with an odd one, 1-2 in. long, more or less ovate or rotundate, sessile or nearly so, coarsely spiny-toothed and similarly acuminate, very coriaceous, glossy; flowers yellow, on 2-3 lin. long somewhat curved pedicels, forming rather dense, shortly peduncled racemes usually several together at the ends of the leafy branches; berries oblong or globose, sappy, violet, pruinous, ⅓-½ in. long, containing 2-4 seeds.

Hab.—Tenasserim.

CAPPARIDEÆ.

Flowers usually hermaphrodite, regular or irregular. Sepals 4, free or connate, valvate or imbricate, rarely open in the bud. Petals as many, rarely 2 or none, hypogynous or seated on the disk, imbricate or open in bud. Stamens 4 or more, hypogynous or perigynous, or at the base of, or on, a long or short gynophore. Disk none or tumid, or lining the calyx; ovary-tube stalked or sessile, 1-4-celled, with numerous amphi- or campylotropous ovules on the 2-4 parietal placentas; style short or none. Fruit a capsule or berry. Seeds angular or kidney-shaped. Albumen none. Embryo curved.—Herbs, shrubs, or trees, erect or climbing, often armed with spiny stipules, the leaves simple or digitately 2-9-foliolate. Flowers solitary or in racemes, corymbs, or umbels.

An order of little practical importance. The flower-buds of the caper (*Capparis spinosa*) form a pickle, and might be grown in Prome or Ava. Twenty-five species are recorded from Burma, the greater part of which are spiny climbers.

* Sepals united at base into a funnel- or bell-shaped tube.
Petals none; leaves 1-3-foliolate . . . . . *Niebuhria.*
** Sepals free, or only at the very base connate.
○ Petals present, 4 in number.
Leaves simple; petals imbricate in bud . . . . . *Capparis.*
Leaves digitately 3-5-foliolate; petals open in bud . . . *Crataeva.*
○○ Petals none; sepals 6; leaves simple . . . *Roydsia.*

NIEBUHRIA, DC.

Calyx funnel-shaped, with a cylindrical tube, the lobes valvate, deciduous. Petals none. Torus elongated. Stamens numerous, inserted below the apex of the torus. Ovary long-stalked, 1-celled, with numerous ovules on the 2 placentas. Berries long-stalked, containing 1 or few reniform seeds.—Little trees or shrubs, unarmed, with 1-3-foliolate leaves and solitary or corymbose flowers.

Younger parts puberulous-rough ; petiole very slender ; leaflets coriaceous . . . . . *N. variabilis.*
Quite glabrous ; petiole very slender ; leaflets thin chartaceous . *N. Siamensis.*

1. **N. variabilis,** Kz.—Shrub (?), the younger parts and branchlets roughish puberulous ; leaves very variable in size, shape, and even nervature, 1-3, rarely 2-foliolate, on a 1-1¼ in. petiole (or if 1-foliolate, almost sessile), from linear to oblong- and cuneate-lanceolate, very shortly petioluled, blunt or bluntish apiculate, mucronulate, more or less scabrous on both sides and more so along the midrib beneath, coriaceous when full grown ; flowers and fruits unknown.

Hab.—Ava.—SS. = Ca (?)

2. **N. Siamensis,** Kz.—An evergreen tree or shrub, all parts quite glabrous ; leaves very similar to those of the preceding species, 3- or only exceptionally 4-foliolate, on a slender smooth petiole ¾-1½ in. long ; leaflets linear-oblong, cuneate at the base, very shortly petioluled, 1-2 in. long, very blunt or retuse with a mucro, entire, chartaceous, quite glabrous, fuscescent in drying, the nerves very thin ; flowers whitish, rather small, nodding, on smooth slender pedicels 1-1½ in. long, corymbose-racemose along the terminal shoots ; ovary glabrous, ovoid-oblong, on a slender glabrous gynophore about an inch long ; filaments flexuose, glabrous ; berries ovoid-elliptical, apiculate at both ends, the size of a cherry, glabrous, obsoletely wrinkled ; seeds very few, densely granular.

Hab.—In the adjoining Siamese province of Radbooree.—Fl. Fr. Apr.-May.

CAPPARIS, L.

Sepals usually 4, rarely 5, in 2 rows, the foremost one usually larger and galeate. Petals usually 4, imbricate. Stamens usually indefinite, inserted on the short torus, the filaments free, filiform. Ovary on a longer or shorter stalk, 1-4-celled, with 2-4 placentas bearing several or many ovules ; stigma sessile. Berry more or less stalked, globular to elongate. Seeds 1 or several, immersed in pulp, reniform.—Shrubs or trees, often scandent, prickly or unarmed, with simple leaves. Stipules prickly or setaceous, sometimes very deciduous.

* *Pedicels arising from above the leaf-axils in a line one above the other, or rarely axillary and solitary.*

○ Gynophore and ovary glabrous or nearly so.

× Gynophore very short, glabrous, the leaves chartaceous — *C. roydsiæfolia.*

×× Gynophore long and slender.

\+ All parts glabrous.

‖ Leaves chartaceous, much netveined, with a callose point at the usually retuse apex. — *C. micracantha.*

‖ ‖ Leaves acuminate. Erect shrubs.

Unarmed; sepals and pedicels minutely hairy; stamens 8; petals glabrous . . . . . — *C. multiflora.*

Unarmed; pedicels and sepals outside glabrous; stamens numerous; petals pilose . . . . . — *C. membranifolia.*

Thorny; pedicels glabrous; sepals woolly along the borders; stamens 8 . . . . . — *C. disticha.*

\+\+ Young shoots and sepals rusty or greyish tomentose or pubescent.

Leaves chartaceous, ovate, green, while young tawny or rusty pilose beneath; flowers usually several together; berries smooth . . . . . — *C. horrida.*

Leaves green, oboval, while young thinly appressed pubescent, soon quite glabrous and coriaceous; petioles ½-¾ in. long; flowers several together . . . . . — *C. crassifolia.*

Leaves glaucous, rhomboid-ovate to rhomboid-linear, acute, while young minutely greyish puberulous beneath; petiole only ¼-½ in. long; flowers solitary . . . . . — *C. polymorpha.*

○ ○ Gynophore and ovary densely tomentose.

All younger parts and young leaves tomentose or pubescent, pedicels and sepals densely tomentose; berries almost globose, tomentose, many-seeded . . . . . — *C. flavicans.*

Glabrous; pedicels and sepals outside glabrous; flowers solitary in the leaf-axils . . . . . — *C. Siamensis.*

* * *Pedicels in umbels or corymbs in the leaf-axils or on shortened axillary branchlets, sometimes collected into terminal or lateral panicles.*

× Calyx and pedicels densely tomentose. Ovary glabrous.

All parts tomentose or shortly and densely yellowish pubescent, the hairs not papillose; peduncle naked . . . — *C. grandis.*

Apparently as former; but upper side of leaves papillose; peduncle 1-leafed at tip . . . . . — *C. orbiculata.*

Branches brown-tomentose; leaves glabrous, 3-plinerved . — *C. trinervia.*

×× Calyx and pedicels glabrous. Berry 1-seeded.

○ Gynophore very short (in fruit not above ½ in.); umbels or corymbs peduncled.

Branchlets pubescent; leaves thick-coriaceous, glaucous, retuse or blunt; umbels axillary . . . . . — *C. glauca.*

Glabrous; leaves purplish beneath, acuminate; umbels in terminal panicles . . . . . — *C. ambigua.*

○○ Gynophore long and slender.

× Umbels or corymbs peduncled.

Glabrous; leaves green, retuse; flowers ½ in. in diameter, the umbels in terminal panicles . . . . . — *C. floribunda.*

Glabrous; petiole puberulous; flowers 2 in. in diameter . — *C. versicolor.*

×× Umbels sessile or nearly so.

Leaves green, retuse; corymbs usually terminal on the branchlets, many-flowered . . . . . — *C. sepiaria.*

* *Pedicels arising from the leaf-axils in a line one above the other, or rarely axillary and solitary.*

1. **C. roydsiæfolia,** Kz.—An evergreen scandent shrub, armed with short, straight, spreading thorns, all parts quite glabrous; leaves oblong or elliptically oblong, shortly and strongly petioled, rounded or obtuse at the base, bluntish and mucronate, chartaceous, 6-8 in. long, glabrous, laxly netveined and the nerves beneath strongly prominent; flowers rather large and showy, shortly pedicelled, arising by 4-5 in. a line above the axils of the upper leaves and forming usually terminal glabrous racemes; sepals acute, woolly on the margins; petals floccose pùberulous, the 2 upper smaller ones obovate and pure white, the lower ones nearly an in. long, yellow, afterwards violet-coloured towards the base; ovary glabrous, the gynophore only ¼-½ in. long; stamens numerous, the filaments white glabrous; anthers dull blue.

Hab.—Adjoining Siamese province of Kanbooree.

2. **C. micracantha,** DC.; H.f. Ind. Fl. i. 179.—A large woody climber, armed with very short conical straight thorns, all parts glabrous; leaves oblong to broadly lanceolate, 4-8 in. long, rounded or subcordate at the usually narrowed base, on a ⅓-½ in. long petiole, rounded or almost retuse with a callous mucro, coriaceous, glabrous, shining, laxly netveined; flowers 1½ in. across, by 2-4 supra-axillary in a line, on ½ in. long or shorter pedicels; sepals oblong, acute, ciliate; petals oblong, 1 in. long; ovary glabrous, the gynophore an in. long; berry almost globose or ovoid, 2-3 in. long, smooth.

Hab.—Pegu; Tenasserim.

3. **C. multiflora,** H.f. & Th. Ind. Fl. i. 178.—A large woody climber (?), unarmed, the young shoots sparingly appressed hairy; leaves from elliptical to oblong and obovate-oblong, at both ends acuminate, on a slender petiole only 2-3 lin. long, membranous, 3-6 in. long or longer, glabrous, very laxly netveined; flowers small, on slender slightly pubescent pedicels ½-¾ in. long, numerous, in a line one above the other from the axils of the leaves, or more usually from the leafless part of the branchlets and appearing racemose; sepals concave-rotundate, minutely and sparingly puberulous and usually slightly fringed, about 2 lin. long; petals obovate-oblong, 2½ lin. long, or a little longer, glabrous; stamens 8, the filaments glabrous; ovary and the slender ½ in. long gynophore glabrous; berries globose, 2-celled, usually 1-3-seeded, the size of a pea, glabrous.

Hab.—Ava hills, towards Assam.

4. **C. membranifolia,** Kz.—A scandent shrub with terete blackish stems, unarmed or only a few straight very short spiny stipules on the older branches, all parts glabrous; leaves broadly oblong or ovate-oblong, on a slender, but short petiole, acute at base,

5-6 in. long, abruptly and sharply acuminate, membranous and flaccid, quite glabrous, vividly green ; stipules reduced to mere points ; flowers small, white, on slender 4-8 lin. long glabrous pedicels arising by 4-5 in a line above the leaf-axils ; sepals glabrous, puberulous inside ; petals nearly 3 lin. long, floccose ; stamens numerous, the filaments white ; gynophore and ovary glabrous.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban.—Fl. Apr.-May.

5. **C. disticha,** Kz.—A large, erect, bushy, dense shrub, 8-10 ft. high, the spreading branches as well as the leaves conspicuously distichous, armed with thin, sharp, curved thorns, all parts glabrous ; bark black, smooth ; leaves obovate to obovate-oblong, usually 2-2½, rarely up to 4 in. long, on a short, but slender petiole, rounded at base, abruptly and shortly acuminate, chartaceous, glabrous, net-veined ; flowers small, white, on 4-6 lin. long, glabrous, slender pedicels arising in a line from above the leaf-axils ; sepals pubescent inside, woolly along the borders ; petals unequal, about 3 lin. long, white, woolly ; stamens 8, rarely 9 ; filaments white ; anthers lazuli-blue ; gynophore and ovary glabrous.

Hab.—Frequent in the swamp-forests and in inundated localities of the Irrawaddi- and Sittang-alluvium of Pegu and Martaban ; also in Prome.—Fl. Apr.-May.

6. **C. horrida,** L. f. ; Brand. For. Fl. 15.—*Nah-ma-nee-tanyet.* —A large scandent shrub, armed with short laterally compressed curved thorns, the branchlets and younger parts all rusty-tomentose ; leaves from ovate to ovate-oblong, rounded at base, on a 2-3 lin. long tomentose petiole, 1½-2 in. long, acute, chartaceous, beneath more or less tomentose and glabrescent ; flowers about 1-1½ in. in diameter, on 6-8 lin. long rusty-tomentose rather thick pedicels several together arising in a line above the leaf-axils ; sepals rotundate, rusty-tomentose ; petals white, soon turning rose-coloured or pinkish, slightly woolly inside ; filaments glabrous, white ; anthers blue ; gynophore pilose towards the base ; berries the size of a prune, oblong, red, many-seeded, long stalked.

Hab.—Frequent in the mixed forests and savannahs, also in the dry forests, of Prome, Pegu, and Martaban.—Fl. Apr.-May.

7. **C. crassifolia,** Kz.—A leaf-shedding scandent shrub, armed with short recurved thorns, the younger branches and young leaves beneath greyish from a minute tomentum intermixed with rusty pubescence ; leaves oboval or obovate, on a ½-¾ in. long petiole which is greyish puberulous while young, more or less acute at base, coriaceous, rounded and very shortly recurved-pointed, glabrous, about 2 in. long, the strong nerves beneath arising mostly from near the base ; flowers solitary or several, similar to those of *C. horrida*, on

½-¾ in. long greyish tomentose pedicels ; sepals and petals covered by a rusty-coloured woolly tomentum ; filaments numerous, glabrous ; gynophore and the globular ovary glabrous.

HAB.—Frequent in the mixed dry forests of the Prome District.—Fl. March.

8. **C. polymorpha,** Kz.—A scandent or almost erect glaucous green shrub, armed with short curved puberulous thorns, the branches and branchlets thinly covered with a whitish mealy tomentum ; leaves (those of the shoots much elongated and often rhomboidally linear) rhomboid-ovate to obovate-rhomboid, on nearly ⅓ in. long whitish puberulous petioles, obtuse at base, almost coriaceous, acute, glaucous, especially while young fugaceously whitish downy, the nerves strong and mostly springing from near the base ; flowers solitary, axillary, resembling those of *C. horrida,* but smaller, on ½-⅔ in. long, greyish, or partly rusty-tomentose strong pedicels ; sepals and petals covered all over with a rusty-coloured woolly tomentum ; filaments numerous, glabrous ; gynophore slender and like the ovary, glabrous ; berries (unripe) as large as a cherry, oblong, smooth, many-seeded.

HAB.—Frequent in the dry and Eng forests of the Prome District.—Fl. March ; Fr. Apr.-May.

9. **C. flavicans,** Wall ; H.f. Ind. Fl. i. 180.—A shrub, with the habit of *Cadaba Indica,* armed with very short, straight, spreading thorns, the shoots tawny tomentose ; leaves variable in shape and texture, from obovate and almost cuneate-obovate to oblong, rounded, blunt, or acute at base, on a short but slender petiole, retuse or blunt, ½-1 rarely 1½ in. long, chartaceous or coriaceous, while young densely tawny pubescent, more or less glabrescent, the nerves beneath prominent ; flowers small, solitary or by pairs, on 6-8 lin. long densely tawny tomentose pedicels arising usually from the extremities of short tomentose branchlets and often forming some kind of a spurious raceme or corymb ; sepals densely tawny tomentose ; petals densely woolly inside, about 4 lin. long ; the thick gynophore and ovary densely tawny tomentose ; berries the size of a small cherry, ovate, puberulous, 2-celled, and 2-seeded.

HAB.—Ava.—Fl. H. S. ; Fr. Sept.

* * *Pedicels in umbels or corymbs in the axils of the leaves or on shortened axillary branchlets, sometimes collected into terminal or lateral panicles.*

10. **C. Siamensis,** Kz.—A climbing shrub, the branches glabrous, armed with short rather straight spines ; leaves ovate to ovate-lanceolate, rounded or almost cordate at the base, on a slender petiole about ½ in. long, from rather blunt and almost mucronate to nearly acuminate, thick-membranous and of a texture as in *Olax,*

1½-2 in. long, glabrous or sparingly and indistinctly pubescent on the nerves beneath; flowers rather large, axillary or nearly so, solitary, on slightly puberulous pedicels hardly ½ in. long; sepals broadly ovate, blunt, coriaceous, inside and on the margins shortly tomentose; petals cuneate-obovate, nearly an inch long, densely puberulous inside; filaments glabrous, very numerous; ovary ovoid-spindleshaped, densely and shortly pale tomentose, borne on a pubescent gynophore 6-8 lin. long; ovules numerous on the 3 parietal placentas.

HAB.—Adjoining Siamese provinces, near Radbooree.—Fl. Apr.-May.

11. **C. grandis,** L. f.; H.f. Ind. Fl. I. 176; Bedd. Sylv. Madr. 13.—*var.* **auricans.**—*Hkaw-kwa.*—A crooked tree, hardly 15 ft. high, shedding leaves in HS, armed with short slightly curved thorns tomentose at base, all younger parts softly yellowish tomentose; bark thin, smooth, blackish; cut dry; leaves, while young, flaccid, membranous, and softly tomentose all over, when full grown obovate to broadly oblong, on a rather short tomentose petiole 1-2 in. long, acute on both sides or rarely blunt, with the midrib somewhat excurrent, coriaceous, puberulous or glabrescent above, shortly yellowish tomentose beneath, the midrib and nerves pale-coloured and prominent; flowers small, on 6 to 8 lin. long slender tomentose pedicels forming umbels at the end of the short tomentose branchlets and often collected into a kind of spurious panicle at the end of the branches; sepals tawny puberulous; petals about 3 lin. long, ciliate and slightly pubescent on the inner side; stamens numerous; the slender gynophore and ovary glabrous; berries...

HAB.—Frequent in the dry forests, especially the mixed ones, of the Prome District.—Fl. H. S.—l.—SS. = *CaS,* Lat.

REMARKS.—Wood hard, white, close-grained, heavy and durable; good for turning.

12. **C. orbiculata,** Wall.; H.f. Ind. Fl. i. 176.—A much-branched rigid-spreading shrub, armed with recurved thorns at the broad downy base, the branches pilose; leaves almost orbicular, obscurely trapezoid, on a very short petiole, cordate at base, truncate retuse or mucronate, ⅔-1 in. broad, papillose and hairy above, tomentose beneath; flowers small, on ½-⅔ in. long pedicels, umbelled, the peduncle 1-2 in. long, 1-leaved at top; ovary glabrous; the gynophore less than ½ in. long. (From Hooker's Ind. Fl.) Most probably same as the preceding species.

HAB.—Ava.

13. **C. trinervia,** H.f. & Th. Ind. Fl. i. 175.—Climbing (?), armed with recurved thorns, the branches brown tomentose; leaves broadly lanceolate, tri-plinerved, 2-3 in. long, on a tomentose petiole.

glabrous, the midrib brown tomentose; flowers 1½-2 in. in diameter, in terminal many-flowered corymbs; pedicels 1-½ in. long, the lower ones with foliaceous, the upper ones with minute, bracts; sepals orbicular, tomentose; ovary glabrous; gynophore 1½ in. long.—(From Hooker's Ind. Fl.)

HAB.—Tenasserim.

14. **C. glauca,** Wall; H.f. Ind. Fl. i. 180.—A shrub, armed with recurved short and sharp thorns, the branches greyish puberulous; leaves small, from ovate-lanceolate to lanceolate-oblong acute at base, on a very short puberulous petiole, retuse, thick coriaceous and almost veinless, glaucous, glabrous; flowers probably in umbels, the fruiting peduncle axillary, stout, about ½ in. long; berries the size and shape of a pea, on a ½ in. long peduncle, 1-2-seeded, glabrous, the gynophore very short.—(Partly from Hooker's Ind. Fl.)

HAB.—Ava.

15. **C. ambigua,** Kz.—A large scandent shrub, armed with short, sharp, recurved thorns, the younger parts puberulous; leaves broadly lanceolate, 4-5 in. long, on a puberulous short petiole, acute at base, almost coriaceous, acuminate, glabrous, purplish green beneath, the lateral nerves indistinct; flowers unknown; the fruiting pedicels about 4 lin. long, glabrous, forming by 3-4 poor umbels arranged in a terminal panicle; ovary and gynophore glabrous; berries oblong, about 6 lin. long, smooth, red, 1-seeded.

HAB.—Tropical forests of South Andaman.—Fr. Apr.

16. **C. floribunda,** Wight.; H.f. Ind. Fl. i. 177.—A large woody climber, glabrous, unarmed or armed with recurved thorns; leaves oblong, 3-5 in. long, rounded at both ends, retusely apiculate, coriaceous, shining above, obscurely penninerved below; flowers ½ in. in diameter, white, on ¼-1 in. long pedicels; umbels many-flowered, in large terminal panicles; sepals glabrous, reflexed; petals oblong; stamens about 8; gynophore ½ in. long; berry globose, 1 in. in diameter, smooth, several-seeded.—(From Hooker's Ind. Fl.)

HAB.—Tenasserim.

17. **C. versicolor,** Griff.; H.f. Ind. Fl. i. 175.—Climbing, the branches glabrous, armed with short recurved thorns; leaves lanceolate or oblong-lanceolate, 2-3 in. long, bluntish and retusely acuminate, on a puberulous petiole ¼ in. long, obscurely penninerved, glabrous, shining above, pale beneath; flowers 2 in. in diameter, white, then rose, on an in. long pedicels; corymbs simple, terminal, with the lower flowers axillary, or few-flowered and disposed in lateral racemes 1-1½ in. long; sepals glabrous, ovate, the

outer ones very convex, the inner "petioled"; ovary and the 1½ in. long gynophore glabrous.—(Taken from Hooker's Ind. Fl.)

HAB.—Tenasserim.

18. **C. sepiaria,** L.; H.f. Ind. Fl. i. 177; Brand. For. Fl. 15.—A bushy shrub, 5-7 feet high, armed with recurved sharp thorns about 2 lin. long, the shoots pubescent; leaves elliptical to oblong and oval, 1-2 in. long, on a short pubescent petiole, obtuse or rounded at base, thin coriaceous, notched, glabrous or slightly puberulous beneath, green on both sides or rusty-coloured beneath; flowers numerous, small, white, on slender 7-8 lin. long glabrous pedicels, forming sessile or shortly peduncled umbel-like corymbs at the end of the branchlets; sepals glabrous; petals about 2-3 lin. long, glabrous; stamens numerous; ovary and gynophore glabrous; berries globular, the size of a small cherry or smaller, blackish, smooth, 1-seeded.

HAB.—Common along the rocky coast of the Andamans; Pegu.—Fl. May.

CRATÆVA, L.

Calyx 4-parted, the lobes imbricate and deciduous. Petals 4, long-clawed. Stamens 8-20, inserted on the border of the torus. Ovary shortly stalked, 1-2-celled, with as many placentas bearing numerous ovules in two series; stigma discoid. Berry with a hard rind, 1-2-celled, stalked, few or many-seeded. Seeds reniform.—Trees or shrubs, with digitately 3-5-foliate leaves, and the flowers usually corymbose.

* *Ovary and berry 2-celled.*

Leaves whitish-glaucous beneath, long-acuminate; seeds compressed-reniform, ½ in. long, spinulose-tubercled on the back . *C. lophosperma.*

Leaves as in preceding (?); seeds 1½-2 lin. long, angular and flat, very hard, yellowish . . . . . *C. Narvala.*

* * *Ovary and berry 1-celled; seeds reniform or helicoid, black, smooth.*

Flowers corymbose; fruits globular; large tree . . . . *C. religiosa.*

Flowers solitary, axillary; fruits oblong; meagre shrub . . *C. hygrophila.*

1. **C. Roxburghii,** Ham. (*C. religiosa,* H.f. Ind. Fl. i. 172; Bedd. Sylv. Madr. t. 116; Brand. For. Fl. 16).—*Ka-lat.*—A tree (50—60+15—20 + 3—6), all parts glabrous; leaves 3-foliolate; leaflets cuneate-ovate to obovate-lanceolate, the lateral ones unequal at base, acuminate, glabrous, somewhat glaucous beneath; flowers rather large, white, turning yellowish, or sometimes pale rose-coloured, in terminal corymbs; filaments numerous, purple; berry globular, 1-celled, roughish, the size of a bullet or wood-apple, long-stalked; seeds helicoid-reniform, smooth, 2½-3 lin. long.

HAB.—Not unfrequent in the dry forests of the Prome District; also Upper Tenasserim.—Fl. H. S.; Fr. Close of R. S.—I.

Remarks.—Wood very hard.

N.B.—In Upper Tenasserim occurs another species with the leaves very acuminate and beneath almost whitish-glaucous. It has a 2-celled ovary with very numerous ovules, and may be either *C. lophosperma*, Kz., or more probably *C. Narvala*, Ham.

2. **C. hygrophila**, Kz.—*Yai-kha-tat.*—A low, slender, simple-stemmed or sparingly branched shrub, 2 to 5 feet high, all parts quite glabrous; bark smooth, brown, white-speckled; leaves as in former and of same size, sometimes also much smaller; flowers solitary in the axils of the leaves and said to be white and small; berries spindle-shaped or oblong, 1-2 in. long, 1-celled on stalks of similar length, smooth, of a chocolate colour, white-dotted; seeds reniform, smooth.

Hab.—Not uncommon in the swamp-forests of the Irrawaddi-Alluvium.—Fl. Dec. (?); Fr. Jan.-Feb.—s.

ROYDSIA, Roxb.

Sepals 6, imbricate or almost valvate. Petals none. Stamens inserted on the short torus. Ovary shortly stalked, 3-celled, with numerous ovules on the 2 placentas; stigmas 1-3. Drupe shortly stalked, with a fragile rind, containing a 1-seeded putamen. Testa membranous.—Scandent shrubs, with simple leaves and small racemose flowers.

Styles 3, short, sessile; ovary glabrous	*R. obtusifolia.*
Style long, with 3 minute stigmas; ovary densely pubescent	*R. parviflora.*

1. **R. obtusifolia**, H.f. & Th. Ind. Fl. 180.—*Nga-phyoo.*—An evergreen large climbing shrub, all parts glabrous; bark thin, grey, white-lenticellate; leaves oblong, obtuse at base, about 3-4 in. long, acute or blunt, chartaceous, glabrous, glossy above; flowers small, greenish-white, on tomentose pedicels less than ½ lin. long, forming greyish tomentose racemes or panicles in the leaf-axils or compound panicles at the end of the branches; sepals a line long, tomentose, 4 of them free, linear-oblong, the 2 others combined so as to make the calyx apparently 5-sepalled; stamens unequal, constantly 21; filaments white; anthers yellow, turning greenish; ovary 3-cornered and 3-celled, the numerous ovules attached to the angle of the central axis; stigmas 3, linear, sessile; drupes elliptically oblong, the size of a prune, somewhat rough, greyish-green.

Hab.—Frequent in the swamp-forests and along inundated marshy river-banks of the alluvial lands of the Irrawaddi and Sittang rivers; also Tenasserim.—Fl. March; Fr. May-June.—s: l.

2. **R. parviflora**, Griff.; H.f. Ind. Fl. i. 409.—A climbing shrub; leaves elliptical or elliptically lanceolate, 4-7 in. long, on a slender petiole ⅓-½ in. long, acuminate, glabrous, rather membran-

ous, the nerves almost horizontal; flowers ¼ in. in diameter, densely tomentose, in short very pubescent axillary racemes, and forming small terminal panicles; sepals 6, imbricate in 2 series, strap-shaped, blunt, densely pubescent, finally recurved; stamens about 20, not much exceeding the sepals; ovary densely pubescent, on a gynophore of its own length, 3-celled; style subulate with 3 minute stigmas; ovules about 4 in each cell.—(From Hooker's Ind. Fl.)

Hab.—Ava.

MORINGACEÆ.

Flowers hermaphrodite, irregular. Calyx cyathiform, 5-parted, the lobes unequal and spreading, imbricate in bud. Petals 5, almost conform with the sepals, the 2 upper ones smaller. Disk filling the calyx-tube, free along the very short margin. Stamens inserted to the disk-margin, 5 fertile ones alternating with as many rudimentary and often bristle-like ones; filaments free; anthers 1-celled, longitudinally dehiscing. Ovary stalked, 1-celled, with 3 parietal placentas bearing many ovules in 2 rows; style slender with a perforate, truncate stigma. Capsule pod-like, 3-6-angular, 1-celled, 3-valved, many-seeded. Seeds winged or not, separated by spongy walls, without albumen.—Trees, with 2-3-pinnate leaves. Stipules none or reduced to stalked glands. Flowers in axillary panicles.

MORINGA, Juss.

Generic characters those of the family.

1. **M. pterygosperma,** Gaertn.; H.f. Ind. Fl. ii. 45; Bedd. Sylv. Madr. t. 80; Brand. For. Fl. 129.—*Dan-tha-lone.*—A tree (30—40 + 10—20 + 3—4), the younger parts puberulous; bark longitudinally corky-cracked, grey, about an in. thick; cut whitish-green; leaves supra-decompound, the pinnæ and secondary pinnæ all opposite, the rachis and petioles, especially while young, more or less shortly puberulous; leaflets small, 3-6 lin. long, obovate, entire, blunt, on a very short but slender puberulous petiolule, membranous, glaucous green, minutely pubescent above, pale-coloured and slightly pubescent along the midrib beneath; flowers white (rarely red), rather large, on 6-8 lin. long puberulous pedicels forming axillary densely puberulous or shortly pubescent panicles; pods 1-1½ ft. long, 3-angular and furrowed, greyish puberulous, more or less torose, 3-valved; seeds 3-angular, the angles expanded into spongy wings.

Hab.—Cultivated in villages all over Burma and the adjacent islands.—Fl. CS.; Fr. H. S.

Remarks.—Wood soft, white. Exudes yellow gum. Seeds yield the oil of ben.

VIOLACEÆ.

Flowers regular or irregular, with two bractlets at base. Sepals 5, persistent, equal or unequal, imbricate. Petals as many, hypogynous, equal or unequal, imbricate or twisted in bud. Stamens 5; filaments short, broad; anthers free or connate, the connective broad and produced beyond the cells. Ovary sessile, 1-celled, with many anatropous ovules attached to the 3 parietal placentas; style simple; stigma capitate, truncate, or cup-shaped, entire or lobed. Fruit a 3-valved capsule, rarely a berry. Albumen fleshy. Embryo small, with flat cotyledons.—Herbs or shrubs, rarely small trees, with alternate, entire, or pinnatisect leaves and stipules.

An order of little importance, of which 10 species occur in Burma, amongst which 4 kinds of violets. The roots of some species are more or less emetic; a few serve also for purgatives, and are used as a substitute for ipecacuanha.

ALSODEIA, Thouars.

Sepals 5, almost equal. Petals as many, nearly equal, sessile. Stamens 5, inserted inside or on an annular disk, the connective produced into a membranous often broad appendage. Ovary 1-celled, with few or many ovules; style straight with a termina stigma. Capsule 3-valved, few-seeded.—Shrubs or small trees, with usually alternate leaves and rigid stipules. Flowers small, in clusters, cymes, or racemes.

* *Stamens exserted; anthers cohering in a cone* . . *A. Roxburghii.*
* * *Stamens included; anthers free.*
× Ovary and style glabrous. Capsules glabrous.
Flowers fascicled, pediceled . . . . . *A. Bengalensis.*
Flowers in minutely puberulous racemes . . . . . *A. longiracemosa.*
×× Ovary and style pubescent or tomentose. Capsules from puberulous to mossy-echinate.
Flowers clustered, pubescent . . . . . *A. Griffithii.*
Flowers in cymes; capsules densely pubescent . . . . *A. mollis.*

1. **A. Roxburghii,** Wall; H.f. Ind. Fl. i. 186.—A small shrub, the younger parts sprinkled with minute hairs; leaves elliptical to rhomboid-lanceolate, very shortly petioled, narrowed at base, crenate, blunt or acute and mucronate, membranous, pale beneath, 1½-2 in. long; flowers very small, greenish-white, in almost sessile axillary clusters; sepals acute; petals thinly clawed; anthers bearded at base, cohering in a cone; capsules very small, almost sessile, glabrous.

Hab.—Not unfrequent in the tropical forests of the Andaman Islands.—Fl. May-June.—s.—SS.= SiS.

2. **A. Bengalensis,** Wall.; H.f. Ind. Fl. i. 186.—An evergreen shrub, growing out into a small tree from 20 to 25 ft. high, all parts glabrous; leaves lanceolate to broadly lanceolate, shortly and slenderly petioled, acuminate, serrulate, glabrous; flowers small, whitish, on long glabrous pedicels, arising usually with the young leaves in axillary fascicles; bracts linear, acuminate, slightly appressed pubescent or glabrous; petals ovate-oblong, reflexed at their tips; anthers free, the appendage oval; capsules long-peduncled, glabrous; seeds maculate.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban, entering here also the drier hill-forests up to 4,000 ft. elevation; common on the Andamans.—Fl. H. S.—SS. = SiS., Metam, &c.

3. **A. longiracemosa,** Kz. (*A. racemosa,* H.f. & Th. Ind. Fl. i. 186).—A little tree, 15-20 ft. high, or a large simple-stemmed shrub, shedding leaves in the HS; bark grey, longitudinally and narrowly fissured, corky, about a lin. thick; leaves elliptically to oblong-lanceolate, on a short, but slender glabrous petiole, acuminate at both ends, 3-4 in. long, serrate, chartaceous, glabrous, slightly glaucescent beneath; racemes slender, solitary, arising from above the scars of the fallen leaves, 3-5 in. long, slightly puberulous; flowers small, greenish-white, on short puberulous pedicels; bracts 1-2 at the base, small, lanceolate, puberulous outside; sepals very broad, acute; petals oblong, almost blunt; filaments short, slightly puberulous; anthers slightly bearded at base, the connective large and broad, rounded; capsules and seeds glabrous, the former peduncled.

Hab.—Frequent in the tropical forests and the moister upper mixed forests of Martaban and Tenasserim, up to 1,500 ft. elevation.—Fl. March; Fr. Apr.—s.—SS. = Metam.

Remarks.—Wood yellowish-white, turning pale brown, soft, fibrous, but close-grained, rather light.

4. **A. Griffithii;** H.f. & Th. Ind. Fl. i. 187.—An evergreen shrub (?), the branchlets puberulous; leaves elliptically oblong, on a stout ½ in. long petiole, acuminate, serrulate, 8-10 in. long, shining above, bearded in the nerve-axils beneath; stipules ½ in. long, oblong-lanceolate, pubescent; flowers small, pubescent, clustered on short branched very stout peduncles; sepals broadly ovate; filaments very short; anthers free, with a short spur at the outer base of each cell, and a very large orbicular membranous ciliolate tip to the connective broader than the anther itself; ovary and style hairy.—(From Hooker's Ind. Fl.)

Hab.—Ava.

5. **A. mollis;** H.f. & Th. Ind. Fl. i. 188.—A shrub, the softer parts brownish tomentose; leaves obovate to oblong-lanceolate, very

shortly petioled, narrowed and usually unequal at base, acuminate, coarsely and irregularly serrate or serrulate, glabrescent above, beneath pubescent; flowers rather small, in short peduncled axillary tomentose cymes; bracts broadly reniform, slightly velvety; calyx and pedicels tomentose; connective short and acute; capsule ¼ in. in diameter, densely pubescent.

HAB.—Tenasserim.

BIXINEÆ.

Flowers regular, hermaphrodite or unisexual. Sepals 4-5, rarely 2 to 6, imbricate, free and connate and bursting irregularly, often deciduous. Petals 4 to 5, or wanting, imbricate or twisted in the bud, deciduous. Stamens usually hypogynous; anthers 2-celled, bursting by pores or slits. Disk thickened, often glandular. Ovary 1- rarely several-celled, with parietal amphitropous or anatropous ovules; style and stigmas free or united. Fruit dry or fleshy, indehiscent, or opening by valves bearing the seeds in the middle. Seeds usually few, sometimes with an arillus or the testa pulpy. Albumen copious, fleshy. Embryo axile, the cotyledons leafy and often cordate.—Trees or shrubs, with alternate usually simple or sometimes palmatilobed leaves. Stipules minute or none. Flowers axillary or terminal, solitary or in clusters, corymbs, racemes, or panicles.

About 13-14 Burmese species of this order are known, and a few of them are trees of some interest to the forester. The fruits of some are edible; the red pulpy testa of the seeds of *Bixa Orellana* furnish the Arnotto of the shops.

* *Petals without a scale or basal appendage.*
× Petals broad, twisted in bud. Fruit a capsule.
Capsule 3-5-celled; leaves palmatilobed . . . . . *Cochlospermum.*
Capsule 2-valved; leaves entire or nearly so . . . . . *Bixa.*
×× Petals none or small. Fruit a drupe or berry.
○ Petals 4-6; flowers hermaphrodite . . . *Scolopia.*
○ ○ Petals none. Flowers usually dioecious.
Ovary 2-8-celled . . . . . *Flacourtia.*
Ovary 1-celled . . . . . *Xylosma.*
* * *Petals with an adnate scale or basal appendage.*
× Stamens connate.
Sepals connate, dividing into 2-4; stamens 4-5; flowers racemose . *Ryparia.*
×× Stamens free.
Sepals connate; stamens numerous . . . . . *Gynocardia.*
Sepals free, much imbricate; stamens 5 or indefinite . . . *Hydnocarpus.*

COCHLOSPERMUM, Kth.

Flowers hermaphrodite. Sepals 5, contorted in bud, deciduous. Petals as many, large. Stamens numerous, inserted on the glandless torus; anthers opening by apical pores or very short slits.

Placentas 3-5, more or less projecting, with numerous ovules. Capsule 3-5-valved. Seeds kidney-shaped or spirally curved, woolly or hairy-fringed.—Trees or shrubs, with usually palmatilobed leaves and large yellow racemose flowers.

1. **C. gossypium,** DC.; H.f. Ind. Fl. i. 190; Bedd. Sylv. Madr. 14; Brand. For. Fl. 17.—A tree (20—30 + 6—15 + 2—3), leaves about 8-10 in. each way, palmatilobed, with the lobes acuminate and entire, tomentose, turning glabrous above; flowers large, yellow, in terminal racemes; capsule shortly obovate, large, 3-5-celled, glabrous; seeds numerous, almost kidney-shaped, woolly.

Hab.—Rare in the dry forests on the hills of Prome.—Fl. March.—l.—SS.= CaS.

Remarks.—Wood soft and only fit for firewood. Yields a clear white gum called in Hindustan kadira, a substitute for tragacanth.

BIXA, L.

Flowers hermaphrodite. Sepals 5, imbricate, deciduous. Petals. 5, contorted. Anthers opening by apical pores. Placentas 2, bearing many ovules. Capsules opening loculicidally in 2 valves bearing the placentas on them. Seeds many, funicled, with a pulpy testa. Albumen fleshy.—Small trees, with simple entire leaves. Flowers showy.

1. **B. Orellana,** L.; H.f. Ind. Fl. i. 190; Bedd. Sylv. Madr. t. 79; Brand. For. Fl. 17.—*Thee-ding.*—An evergreen tree (20—25 + 9—18 + 1—2), often remaining shrubby, the younger branchlets often covered with a rusty-coloured scurfy tomentum; bark effen, about 1-2 lin. thick, longitudinally covered with corky pustules, grey; cut reddish; leaves broadly cordate to ovate, long-petioled, sometimes angular or shortly lobed, entire, glabrous, 4-8 in. long; flowers large, rose-coloured or white, in terminal panicles; capsules nearly globular or ovoid, purplish, covered with long soft prickles.

Hab.—Frequently cultivated all over Burma and occasionally seen as an escape along the choungs of the Pegu Yomah.—Fl. RS.—SS = ∞ All. SiS., Metam.

Remarks.—Sapwood red, heartwood pale-coloured. The orange-red pulpy testa of seeds furnishes the arnotto-dye or terra Orellana.

SCOLOPIA, Schreb.

Flowers hermaphrodite. Sepals 4-6, slightly imbricate in bud. Petals as many, almost conform, imbricate. Stamens many with few ovules on the 3-4 parietal placentas. Berry 2-4-seeded. Seeds funicled, the testa hard.—Trees, often spiny, with simple, entire, or toothed leaves and small racemose flowers.

Drupes almost globular, the size of a small pea ; leaves opaque above . . . . . *Sc. Roxburghii.*
Drupes obovoid, the size of a small cherry ; leaves shining on both sides . . . . . *Sc. lucida.*

1. **S. Roxburghii,** Clos. ; H.f. Ind. Fl. i. 190.—An evergreen tree, all parts glabrous, the older branches dreadfully armed with long, strong, straight and compound spines ; leaves oblong to elliptically oblong, shortly petioled, 4-6 in. long, tri-plinerved, bluntish acuminate, remotely and bluntish serrate, glabrous, opaque or shining ; flowers small, pale yellow, on 4-6 lin. long puberulous pedicels, forming solitary axillary puberulous racemes shorter than the leaves ; stigma 3-lobed ; berries oblong, the size of an olive, containing a few roundish oval seeds imbedded in a soft yellow pulp.

Hab.—Tenasserim.

2. **S. lucida,** Wall.—An evergreen tree or shrub, all parts quite glabrous ; leaves elliptically lanceolate to lanceolate, acute at the base, on a glabrous petiole $\frac{1}{3}$ to $\frac{1}{2}$ in. long, long caudate-acuminate, remotely crenate, $2\frac{1}{2}$-4 in. long, coriaceous, glossy on both sides ; fruiting racemes glabrous, stout ; calyx in fruit glabrous ; drupes obovoid (unripe), about $\frac{1}{2}$ in. long, pointed, glabrous, on a glabrous stout peduncle about 3 lin. long.

Hab.—Tenasserim.—Fr. Aug.

FLOCOURTIA, Comm.

Flowers dioecious. Sepals 4 or 5, scale-like, imbricate, in the males sometimes reduced to bractlets. Petals none. Stamens numerous. Ovary 2-5-celled, with usually paired ovules attached to the cell-walls ; styles 2-5, free or connate at base. Berry containing 2 to many hard pyrenes.—Trees or shrubs, often spiny, with simple leaves and small racemose or clustered flowers.

* *Stigma simple, subulate (not thickened at apex).*
Berries the size of a pepper-kernel ; pyrenes smooth, convex on back . . . . . *F. Sumatrana.*
* *Styles short or almost wanting, thickened or truncate at the apex, or more or less bluntish 2-lobed.*
○ Pyrenes compressed and quite flat.
Armed with spines ; branchlets and leaves glabrous, or nearly so ; flowers dioecious . . . . . *F. cataphracta.*
As former but not armed ; flowers hermaphrodite . . . *F. inermis.*
○ ○ Pyrenes obovoid-3-angular, with rounded back.
× Leaves acuminate.
Branchlets and leaves tawny pubescent . . . . . *F. mollis.*
× × Leaves blunt, or nearly so. Berries the size of a pea.
Leaves coriaceous, 3-4 in. long . . . . . *F. sapida.*
Leaves small (1-1½ in. long), membranous.
Armed with numerous long spines . . . . . *F. sepiaria.*
Unarmed, or only with a few short axillary spines . . . *F. rotundifolia.*

1. **F. Sumatrana,** Planch; H.f. Ind. Fl. i. 192.—A tree (?), apparently unarmed; leaves very large, 8-11 in. long, oblong, obtuse or acute at base, on a thick, glabrous petiole 5-7 lin. long, shortly acuminate, coarsely crenate-serrate, chartaceous, glabrous; racemes 2-3, axillary, puberulous, 2-3 in. long; pedicels jointed, puberulous, slender; unripe berries the size of a pepper-kernel, with 3-4 spreading, simple, subulate styles free almost from the base; seeds small, smooth, convex on the back.

Hab.—Tenasserim.

2. **F. cataphracta,** Roxb.; H.f. Ind. Fl. i. 193; Bedd. Sylv. Madr. t. 16.—*Na-yuwai.*—A tree (30—50 + 10—30 + 3—5), shedding leaves in the HS, the stems fearfully armed with compound spines, the males less so, the young shoots slightly pubescent; bark 1-2 lin. thick, smooth or roughish, pulling off in irregular flakes; cut dry, pale-coloured; leaves ovate-oblong to oblong-lanceolate, 3-4 in. long, rounded or acute at base, shortly but slenderly petioled, acuminate, crenate-serrate, chartaceous, glabrous or tawny pubescent along the midrib beneath; racemes short, shortly tomentose or puberulous, often arising from the younger lateral tomentose branchlets; sepals puberulous, villous inside; berries oblong or ovoid, the size of a cherry, bluish-black, smooth, containing 14 to 10 very compressed tubercled-wrinkled large seeds in 5 to 7 vertical pairs; styles connate, short, the stigmas almost horse-shoe-shaped dilated.

Hab.—Frequent in the upper mixed forests of the Pegu Yomah and Martaban.—Fl. Jan.-Feb.; Fr. May.—l.—SS. = ∞ *SiS.*

Remarks.—Wood rather heavy, brown, close-grained, rather hard and brittle, takes a fine polish.

3. **F. inermis,** Roxb.; H.f. Ind. Fl. i. 192; Bedd. Sylv. Madr. t. 16 & An. t. 2. f. 4.—A middling-sized tree (40—50 + 8—20 + 4—5), the shoots puberulous; leaves ovate to oblong-lanceolate, 4-8 in. long, acute or rounded at base, on a $\frac{1}{3}$-$\frac{1}{2}$ in. long petiole, acute or acuminate, bluntish serrate, coriaceous, glabrous; flowers hermaphrodite, in fascicled pubescent racemes; disk covered with fleshy orange glands; berries the size of a cherry, acid, containing 8-10 flattened pyrenes; stigmas 4-8, 2-lobed.

Hab.—Martaban, cult. (?)—Fr. May.

Remarks.—Wood red-brown, heavy, rather hard, of a somewhat unequal fibre, but close-grained.

4. **F. mollis,** H.f. & Th. Ind. Fl. i. 192.—A tree, apparently unarmed, the branchlets almost rusty pubescent; leaves oblong-lanceolate or oblong, on a short tomentose petiole, rounded or obtuse at base, 5-7 in. long, bluntish acuminate or apiculate, crenate-

serrate, chartaceous, the under-surface and midrib above softly pubescent and on the nerves tawny or rusty tomentose; flowers dioecious, in very short tawny tomentose racemes.

HAB.—Tenasserim.

5. **F. sapida,** Roxb.; H.f. Ind. Fl. i. 193.—*Na-yuwai.*—A tree (25—30+10—15+2—3), often reduced to a much-branched shrub, armed with scattered, simple, or compound spines, the younger parts quite glabrous or more or less greyish tomentose; leaves ovate to obovate-oblong, on a rather strong reddish petiole, obtuse or rounded at base, 3-4 in. long, blunt, crenate-serrate, membranous or almost chartaceous, while young often greyish pubescent, soon glabrescent, the midrib red; flowers small, yellowish, on rather short thick pedicels, forming short tomentose or glabrous racemes; sepals puberulous or glabrous outside, tomentose inside; berries the size of a pea, reddish, glabrous, containing 8-10 smooth pyrenes convex on the back; styles cohering at base, but in fruit often removed from each other so as to appear like so many separate styles; stigmas thickened and shortly 2-lobed.

HAB.—The glabrescent form common in the dry and Eng-forests of the Prome District and Ava.—Fl. Fbr.—March; Fr. March-May—l.—SS. = CaS.

6. **F. sepiaria,** Roxb.; H.f. Ind. Fl. i. 194; Bedd. Sylv. Madr., 16.—A low dioecious shrub, about 2 to 5 ft. high, shedding leaves in HS., the younger parts armed with numerous straight spreading spines (reduced branchlets) bearing usually flowers and leaves; leaves small, obovate to oblong, 1-1½ in. long, acute or obtuse at base, on a short very slender puberulous petiole, blunt, towards the apex crenate-serrate, membranous, when full grown rigid and almost coriaceous, glabrous; flowers small, greenish, on a slender glabrous or slightly puberulous pedicels 2-2½ lin. long, forming axillary and terminal poor racemes or almost solitary; berries as large as a pea, about 5-seeded; seeds smooth, rounded on the back; the styles almost sessile, thick and connate, shortly 2-lobed, the lobes bluntish.

HAB.—Chittagong.

7. **F. rotundifolia,** Clos.—A tree (15—20+8—12+½—1), shedding leaves in HS., unarmed, or with short axillary spines, the shoots puberulous; leaves obovate-cuneate or rotundate, on a slender puberulous petiole 1½ lin. long, about 1½ in. long, blunt, crenate, membranous, glabrous; flowers small, greenish, on short, but slender tawny pubescent pedicels forming short axillary tawny pubescent racemes; berries globular; styles 4-5, short, spreading.

HAB.—Rather frequent in the upper mixed forests of the Andamans.—Fl. May—l.—SS. = Serpentine and other rocks.

XYLOSMA, Forst.

Flowers dioecious. Sepals 4-5, scale-like, imbricate in bud. Petals none. Stamens numerous, the anthers versatile, short. Ovary seated on an annular disk, 1-celled with 2 or rarely 3-6 parietal placentas bearing 2 or only a few ovules; style simple or more or less divided, and the stigmas dilated, or rarely the stigma almost sessile and peltate. Berry 2-8-seeded.—Trees, often spiny-armed, with tooshed or rarely entire leaves. Flowers small, clustered or in short racemes.

1. **X. sp.**—An evergreen glabrous tree (30—35 + 8—15 + 2—3½) with the leaves similar to those of *X. longifolium*; flowers and fruits unknown. May be *X. longifolium*.

Hab.—Frequent in the swamp forests of the Irrawaddi alluvium of Pegu.

GYNOCARDIA, R. Br.

Flowers dioecious. Calyx cup-shaped, 5-toothed or rupturing into 3-5 segments. Petals 5, with a scale at their bases. Males: stamens numerous; anthers basifix. Females: staminodes 10-15. Placentas 5, bearing numerous ovules. Berry large, globular, with hard rind. Seeds irregularly obovoid. Albumen oily-fleshy.—Trees, with simple leaves and fascicled large flowers.

1. **G. odorata,** Roxb.; H.f. Ind. Fl. i. 195.—An evergreen tree (40—50 + 12—20 + 3—4), all parts glabrous; bark about ¼ in. thick, rather smooth, ash-coloured; cut pale-coloured, dry; leaves oblong to elliptically lanceolate, acute at base, on a rather slender 3-4 lin. long petiole, abruptly acuminate, almost coriaceous, glabrous; flowers pale yellow, almost 1½ in. in diameter; the females larger, fragrant, on 1½ in. long peduncles, fascicled, arising from tuberosities from the trunk and larger branches; stamens in males very numerous, with woolly filaments; staminodes in females 10, pinnatified, villous; berries as large as an orange, on a rather slender peduncle 1-1½ in. long, globular, with a thick, ash-coloured, roughish bark; seeds numerous, imbedded in pulp.

Hab.—Not unfrequent in the tropical forests of the Martaban hills, up to 3,000 ft. elevation; also Chittagong.—Fr. March.—s.—SS.=Metam.

Remarks.—Wood light brown, striated.

HYDNOCARPUS, Gaertn.

Flowers unisexual. Sepals 4 or 5, much imbricate. Petals 5-9, with a scale at their base, or the scales cohering in a cup. Males: stamens definite or indefinite; anthers basifix. Females:

staminodes 5 or more. Placentas 3-6; stigmas as many, sessile or nearly so, dilated. Berry large, globular, with a hard rind. Testa crustaceous. Albumen oily-fleshy.—Trees, with simple, entire, or serrate leaves and small racemose flowers.

Sepals 4; petals and staminodes 9-5 each, the latter free or united . *H. heterophyllus*·
Sepals 5; petals and staminodes 5 each . . . . . *H. castaneus.*

1. **H. heterophyllus,** Bl.—*Kal-law-hso.*—An evergreen tree (40—50 + 12—20 + 3—5), the leaf-buds tawny puberulous; bark greenish-grey, rusty-lenticellate, 1½-2 lin. thick; cut greenish; leaves oblong or elliptically oblong, 7-8 in. long, on a rather slender 8-9 lin. long petiole, acute at base, abruptly and shortly acuminate, almost coriaceous, entire, glabrous; male flowers about 4-5 lin. in diameter, on slender 4 lin. long glabrous or slightly puberulous pedicels, forming short branched slightly puberulous racemes in the axils of the leaves; sepals 4, concave, broadly oblong, the 2 outer larger ones with whitish borders; petals 9-5, oval, pubescent, villous-ciliate, greenish-white; scales 9-5, free, or united at base into a 5-9-lobed petaloid cup; stamens c. 17, the filaments pilose; ovary reduced to the pilose style, which is 2-lobed at apex; berries as large as an orange, globular, on a very thick c. 2 lin. long peduncle, the rind granular, tawny velvety; seeds numerous, irregularly oval, imbedded in pulp.

Hab.—Very frequent in the tropical forests of Martaban, less so along the eastern and southern slopes of the Pegu Yomah; also Tenasserim.—Fl. Apr.; Fr. Febr.-March.—s.—SS.=SiS., Metam.

Remarks.—Wood heavy, strong, close-grained, of short fibre, yellowish-white, turning light brown.

2. **H. castaneus,** H.f. & Th. Ind. Fl. i. 197.—A middle-sized tree, perfectly glabrous; leaves linear-oblong, 8-14 in. long, rounded at the one of the unequal base-sides, on a ¾-1 in. long petiole much thickened at end, acuminate, thick-coriaceous, shining; female flowers apparently solitary, ¾ in. in diameter, sweet-scented, on a ¾ in. long axillary peduncle; petals concave, blunt, quite glabrous; sepals orbicular, densely rusty pubescent; scales almost acute, silky, narrower than the petals; staminodes 5, glabrous; ovary villous; berry the size of an orange, globose, rugose, brown.—(After Hooker's Fl. Ind.)

Hab.—Tenasserim, Mergui archipelago.

RYPARIA, Bl.

Flowers dioecious. Calyx globular, rupturing into 3-4 segments. Petals 4-5, at base furnished with a scale. Males: stamens 4 or 5, the filaments united into a tubular column enclosing the ovary rudiment. Females: staminodes 4-5, subulate or pedicellate. Pla-

centas 1-3, bearing 2 or more ovules. Stigmas broad, notched. Berry 1-2 seeded, corticate, large.—Trees, with simple leaves and rather small racemose flowers.

1. **R. cæsia,** Bl.—An evergreen tree (20—25 + 8—15 + 2—3), the young shoots appressed brown-pubescent; leaves from oblong to broad-oblong, obtuse at base, on a slightly appressed hispid petiole 1-1½ in. long, cuspidate, 5-6 in. long, beneath glaucescent and sparingly appressed brownish pubescent along the nerves; flowers small, on a strong pedicel, forming elongate axillary tawny tomentose racemes, those of the males up to a foot long, those of the females much shorter; fruits globose, the size of a cherry or a little larger, lenticellate-roughish, grey, usually 2-seeded.

Hab.—Rather frequent in the tropical forests of South Andaman.

PITTOSPOREÆ.

Flowers usually hermaphrodite. Sepals 5, imbricate. Petals 5, hypogynous, imbricate. Torus small. Stamens 5, opposite the sepals; anthers versatile. Ovary 1-celled, with 2 to 5 parietal placentas, or 2-5-celled by the projection of the placentas, with many parietal or axile anatropous ovules; style simple; stigma 2-5-lobed, terminal. Fruit capsular or indehiscent, usually many-seeded. Albumen copious. Embryo small, radicle next the hilum.—Erect trees or shrubs, with alternate or almost whorled simple leaves. Stipules none. Flowers terminal or axillary.

PITTOSPORUM, Banks.

Sepals free or connate at base. Petals erect. Stamens 5, erect. Ovary sessile or shortly stalked, incompletely 2-3-celled, with 2 or more ovules on each placenta. Capsule woody, 1-celled, 2-or rarely 3-valved. Seeds arillate or imbedded in pulp.—Trees or shrubs, with simple leaves and small flowers.

1. **P. ferrugineum,** Ait.; H.f. Ind. Fl. i. 199.—A spreading much branched tree, young parts rusty pubescent; leaves lanceolate to oblong-lanceolate, 2½-4 in. long, acute or acuminate, while young rusty pubescent, soon glabrescent; flowers ¼ in. long, greenish-white, in corymb-like terminal racemes; ovary rusty-tomentose; capsule 2-valved, rough, about 4-seeded.

Hab.—Tenasserim.

POLYGALEÆ.

Flowers irregular, hermaphrodite. Sepals 5, unequal, the 2 inner ones (wings) often petal-like, imbricate. Petals 5 or 3, distinct, unequal, the lower one usually keel-shaped. Stamens 8,

rarely 4 or 5, hypogynous, the filaments usually united into a sheath; anthers opening by terminal pores or rarely by slits. Ovary free, 1-3-celled, with 1 or more anatropous ovules in each cell; style often curved; stigma capitate or minute. Fruit usually a 2-celled capsule opening loculicidally; rarely 1-celled and indehiscent or samaroid. Seeds often strophiolate. Albumen none or present.—Herbs, shrubs, or trees, rarely climbers, with alternate simple leaves. Stipules none. Flowers 3-bracted, in racemes, panicles or spikes.

* *Petals more or less united into a gamopetalous corolla.*

Stamens 8, united; sepals deciduous, the 2 inner ones wing-like; albumen none; shrubs . . . . . *Chamæbuxus.*

Scandent shrubs; fruit a 1-celled samara . . . . . *Securidaca.*

** *Stamens and petals free.*

Erect shrubs or trees; fruit globular, indehiscent; albumen none . *Xanthophyllum.*

CHAMÆBUXUS, DC.

Sepals unequal, deciduous, the 2 inner ones largest and petal-like. Petals 3, united at the base with the staminal sheath, the lower keel-shaped and usually crested at the apex. Stamens 8, the filaments united for ½ of their length into a split sheath; anthers opening by pores. Ovary 2-celled with a single suspended ovule in each cell. Capsule 2-celled, loculicidally dehiscing, 2-seeded. Seeds strophiolate. Albumen none. Shrubs, with showy flowers.

Flowers pale-lilac; crest of keel 2-lobed, the lobes many-cleft; capsules membranous; strophiole minute, white. . . . *C. karensium.*

Flowers yellow; crest of keel 2-lobed, the lobes many-cleft; capsules coriaceous; strophiole large, orange . . . . . *C. arillatus.*

1. **C. Karensium** (*Polygala Karensium*, Kz.)—A meagre shrub 2-3 ft. high, all parts glabrous; leaves lanceolate or broadly lanceolate, 4-8 inches long, at the base narrowed into a rather long petiole acuminate, membranous, glabrous, glaucescent beneath; flowers rather large, about 6-7 lin. long, white with pale lilac tips, on short but slender pedicels arranged in one-sided axillary and terminal racemes shorter than the leaves; wings somewhat shorter than the keel, obovate lanceolate, blunt; keel doubly longer than the inner petals, terminated by a 2-lobed crest, the lobes many-cleft; capsules small, about 2 lin. long and broad, membranous, rotundate, glabrous, with a double broad chartaceous wing strongly notched at the summit; seeds obovate, silk hairy, with a very short white strophiole.

Hab.—Frequent in the drier hill-forests of Martaban east of Tounghoo, at 4,000 to 6,000 ft. elevation. Fl. Fr. March.—SS=Metam.—l.

2. **C. arillata,** Hassk. (*Polygala arillata*, Ham.; H.f. Ind. Fl. i. 200).—A shrub up to 5 ft. high, the younger parts pubescent; leaves from lanceolate and oblong to obovate-lanceolate, 4-6 in.

long, on a petiole ⅓-½ in. long, acuminate, membranous, glabrous or puberulous; flowers ½ in. long, yellow, racemose, and usually forming terminal panicles; bracts linear, deciduous; sepals very unequal, deciduous, the upper one very concave, the 2 lower ones small, ovate, the wings very large, ovate, purple; keel-crest 2-lobed, the lobes many-cleft; capsule ½-¾ in. long, broadly reniform, fleshy-coriaceous, in a dried state wrinkled, glabrous; seeds large, globose, the strophiole large, orange-coloured.

Hab.—Ava hills.

SECURIDACA, L.

Sepals unequal, the 2 inner ones erect and petal-like. Petals unequal, the 2 lateral ones minute or wanting, the lowermost concave and hooded. Stamens 8, the filaments united. Ovary 1-celled with a solitary ovule. Fruit a 1-celled and 1-seeded samara. Albumen none.—Scandent shrubs, with simple leaves and terminal or axillary simple or compound racemes.

1. **S. inappendiculata**, Hassk. (*S. Tavoyana*, Wall.; H.f. Ind. Fl. i. 208.)—A large woody climber, the young shoots minutely puberulous; leaves oblong to elliptically ovate, 3-4 in. long, rather shortly petioled, obtuse or acute at base, apiculate or shortly acuminate, membranous, glabrous, glaucescent beneath; flowers red, on long and slender pedicels, in racemes forming a compound rather lax terminal panicle; inner sepals about 3 lin. long, keel nearly as long; the lateral petals wholly wanting; samara glabrous, with much raised veins, ending in a wing fully 2 in. long by ½ broad, the inner edge thickened.

Hab.—Arracan; Tenasserim.—Fl. Aug.

XANTHOPHYLLUM, Roxb.

Sepals somewhat unequal. Petals 5, free, declinate, the keel-petal boat-shaped. Stamens 8, all free or partially adnate to the petals. Disk hypogynous, annular. Ovary 1-celled or imperfectly 2-celled, with 2 or more ovules variously attached; style elongate. Fruit globular, with a thick rind, often 1-seeded. Albumen none. Cotyledons thick and fleshy, the radicle short.—Trees or shrubs, with alternate simple leaves. Flowers in racemes or panicles.

* *Ovary sessile.*

○ Panicle remotely supra-axillary (and terminal) . . . *X. virens.*

○○ Panicle or racemes truly axillary (and terminal).

× Ovary and style villous. Leaves glaucescent beneath.

Panicles tawny-puberulous; pedicels thick, 1½-2 lin. long, puberulous . . . . . *X. eglandulosum.*

Racemes slender, in lax tomentose panicles; pedicels slender . . *X. glaucum.*

×× Ovary glabrous, the style slender, pubescent . . *X. flavescens.*

** *Ovary shortly stalked*, glabrous, with a villous thick style . . . . . *X. affine.*

1. **X. virens,** Roxb.—An evergreen tree (50—60+20—30+4—5), all parts glabrous; leaves from oblong to oblong-lanceolate, on a 2-3 lin. long petiole, bluntish acuminate, 4-6 in. long, thin coriaceous, without glands at base, glabrous, slightly glaucescent beneath; flowers rather small, yellowish and pinkish tipped, on a slightly puberulous or glabrous pedicels ½ to 2 lin. long, forming lax peduncled almost glabrous panicles arising far from above the leaf-axils and the upper ones collected into larger terminal panicles; sepals blunt, glabrous, or nearly so, the wings about 3 lin. long; ovary minutely pubescent, the style glabrous, slender with a broadly 2-lobed stigma; ovules often 4; berries globular, the size of a pigeon's egg, olive-coloured, 1-seeded.

Hab.—Rare in the tropical forests of the Pegu Yomah; also Chittagong.—Fl. Febr.—s.—SS. = SiS.

2. **X. eglandulosum,** Griff. (*X. Griffithii,* H.f. Ind. Fl. i. 210).—An evergreen tree, all parts glabrous; leaves lanceolate to oblong- and ovate-lanceolate, acute at base, on a 3-5 lin. long petiole, bluntish acuminate, 4-6 in. long, thin coriaceous, glabrous, glaucescent and opaque beneath; flowers rather small, on tawny puberulous pedicels a line long, forming peduncled tawny velvety panicles in the axils of the leaves and at the end of the branches; sepals bluntish, about 2 lin. long, greyish or tawny puberulous; ovary pubescent.

Hab.—Tenasserim.

3. **X. glaucum,** Wall.; H.f. Ind. Fl. i. 209.—*Thit-hpyoo.*—An evergreen tree (50—60+20—30+4—5), all parts glabrous; bark ½ in. thick, grey, roughish; cut brown; leaves oblong and oblong-lanceolate, acute at base, from blunt to bluntish acuminate, on a 1-2 lin. long slender petiole, chartaceous, glabrous, yellowish-glaucous and opaque beneath; flowers small, pale rose, on about a lin. long tawny puberulous pedicels, forming simple or slightly branched densely puberulous racemes in the axils of the leaves and often collected into a panicle at the end of the branchlets; sepals blunt, densely puberulous, wings about 2½ lin. long; ovary sessile, densely tawny tomentose, terminating in a slender pubescent style; unripe berries globular, puberulous, glabrescent, the size of a large pea.

Hab.—Common in the swamp forests and around inundated jungle-swamps of the alluvial plains and base of hills of Pegu and Martaban; also Tenasserim.—Fl. March-Apr.—s.—SS.=All.

Remarks.—Wood light, but comparatively strong, white and pinkish, soft, probably valuable for furniture.—W.=□′=30—38+155—179 pd.

4. **X. flavescens,** Roxb.—*Thit-hpyoo.*—An evergreen tree (40—50+20—30+6—8), all parts glabrous; leaves oblong to oblong-lanceolate, 4-6 in. long, acute or obtuse and usually 2-glandular at base, on a rather short glabrous petiole, shortly and bluntish acumi-

nate, rigidly coriaceous, glabrous, glossy, turning more or less yellowish in drying; flowers small, yellow and pinkish, on rather thick 1-1½ lin. long puberulous pedicels, forming puberulous, sessile, lax panicles in the axils of the leaves and collected into larger ones at the end of the branches; sepals blunt, puberulous; wings 2-2½ lin. long; ovary sessile, glabrous, the style rather slender, pubescent; berries globular, the size of a cherry, olive-coloured, glabrous and smooth, 1-seeded.

Hab.—Frequent in the swamp-forests of Martaban and Tenasserim; also Chittagong.—Fl. Febr.-May; Fr. May.—s.—SS.=All. Metam.

Remarks.—Wood rather heavy, close-grained, tolerably soft, yellowish.

5. **X. affine,** Benn.; H.f. Ind. Fl. i. 209.—An evergreen tree, all parts glabrous; leaves rather large, oblong to elliptical and obovate-oblong, on a 2-4 lin. long petiole, obtuse or acute and furnished with 2 large hollow glands at base, shortly cuspidate, 5-7 in. long, chartaceous, glabrous, glossy, pale-coloured beneath; flowers rather small, on rather slender 3-4 lin. long puberulous pedicels, forming 1 to 2 in. long greyish puberulous racemes or rather dense sessile panicles in the axils of the leaves and at the ends of the branches; sepals 3 lin. long, greyish-velvety, bluntish; ovary glabrous with a very thick densely pubescent style.

Hab.—Tenasserim.

TAMARISCINEÆ.

Flowers regular, usually hermaphrodite. Sepals 5 (4-6), free, imbricate. Petals as many, free or slightly connate at base. Stamens 4 to 10, free, inserted to a small annular hypogynous disk, or united at base; anthers 2-celled, longitudinally dehiscing. Ovary free, 1-celled, with 3-4 placentas from the base of the cell bearing numerous ovules; stigmas 3-4. Seeds with a sessile or stalked tuft of hairs. Albumen none.—Shrubs or trees, with minute scale-like leaves and small flowers in spikes, racemes, or panicles.

Only 2 species of this order are found in Burma. The galls of the Indian species of *Tamarix* are highly astringent and used in medicine and dyeing; the ash of *T. gallica* is rich in sulphate of soda.

TAMARIX, L.

Stamens 4-10, free. Styles 3-4, dilated into stigmas. Seeds with a sessile plume of hairs at apex.—Shrubs or small trees, with scale-like leaves and small flowers in spikes or racemes, sometimes collected into panicles.

Leaves appressed to the terete almost simple branchlets; flowers sessile, rose-coloured, in dense short terminal spikes. . *T. dioica.*
Leaves stem-clasping, somewhat spreading; flowers pediceled, white, in loose slender racemes . . . . . *T. Gallica.*

1. **T. dioica,** Roxb.; H.f. Ind. Fl. i. 249; Bedd. Sylv. Madr. 20; Brand. For. Fl. 21, t. 6.—An evergreen glaucous small tree or shrub, with cicatrisate red-brown branches and spuriously articulate branchlets, all parts glabrous; leaves scale-like, ovate, subulate or acuminate, keeled, spuriously imbricate and somewhat succulent; flowers dioecious, small, sessile, rose-coloured, in dense robust spikes terminating the branchlets; bracts as long as the flowers; stamens 5; styles 2-3, elongate and exserted; capsules about 2 lin. long, attenuate.

Hab.—Ava.—Fl. C.S.; Fr. R.S.

2. **T. gallica,** L.; H.f. Ind. Fl. i. 248; Bedd. Sylv. Madr. 20; Brand. For. Fl. 20, t. 5.—An evergreen glaucous small tree or large shrub, the branches usually dark-brown or blackish, all parts glabrous; leaves scale-like, oblong or lanceolate, stem-clasping; flowers very small, white, on short pedicels or almost sessile, drooping, in loose very slender $1\frac{1}{2}$-2 in. long racemes; bracts as long as the flowers; stamens 5; disk 10-toothed; styles 3, rather long, but not exserted; capsules about 2 lin. long, attenuate.

Hab.—Rather frequent in the tidal savannahs and tidal forests of Lower Pegu.—Fl. R.S.; Fr. C. S.—l.—SS.=Sal.

Remarks.—Wood reddish-white, coarse-grained, rather hard and tough, but not strong; good for fuel.

HYPERICINEÆ.

Flowers regular, hermaphrodite. Sepals 5, imbricate. Petals 5, hypogynous, imbricate, often twisted. Stamens indefinite, hypogynous, usually more or less distinctly united into 3 or 5 (rarely 1) bundles, or wholly free; anthers 2-celled, dehiscing longitudinally; ovary 3- to 5-celled, or rarely spuriously 1-celled, with numerous ovules in 2 rows, or few or solitary erect or horizontal ovules in each cell; styles free, or more or less connate; stigmas usually club-shaped or capitate. Fruit a septicidal or loculicidal capsule, or an indehiscent berry. Seeds straight or curved, not arillate. Albumen none. Embryo with half-cylindrical or convolute cotyledons.—Shrubs or herbs, rarely trees, with usually opposite simple leaves. Stipules none. Flowers in cymes or panicles, rarely solitary.

A family of little importance to the forester. Only 8 species are known from Burma, a few of which are arboreous.

CRATOXYLON, Bl.

Sepals and petals 5, the latter with or without a basal appendage. Stamens 3-delphous, the staminal bundles often alternating with as many hypogynous glands. Ovary 3-celled, with 1 or more

ovules in each cell. Capsule 3-valved, opening loculicidally. Seeds winged at upper end.—Trees or shrubs, with simple dotted leaves. Flowers in axillary cymes or terminal panicles, rarely solitary.

* *Petals furnished with a basal scale.*

All parts glabrous; petals white, entire. . . . . *C. formosum.*

Pedicels, sepals, and underside of leaves pubescent; petals lilac, fringed *C. pruniflorum.*

* * *Petals without basal scale, pink or crimson.*

○ Flowers in axillary poor cymes or solitary . . . *C. polyanthum.*

○ ○ Flowers in terminal panicles.

Leaves linear-oblong, usually almost sagittate at base, chartaceous . *C. neriifolium.*

Leaves more or less obovate-oblong, coriaceous . . . *C. arborescens.*

1. **C. formosum,** Bth. & H.f. Ind. Fl. i. 258.—A tree (20—25 + 8—15 + 1—2), leafless during HS., all parts glabrous; leaves elliptical to elliptically oblong, shortly petioled, obtuse or acute at base, 3-3½ in. long, acute or apiculate, glabrous, glaucescent beneath; flowers pure white, on ½ in. long glabrous pedicels, by 2-5 fascicled and together with the shoots from above the scars of the fallen leaves or axillary; sepals glabrous; petals about ½ in. long, with a narrow scale above the slender claw; hypogynous glands oblong, terete, blunt, crimson; staminal bundles 3, very slender, the filaments free from the middle and penicillate; capsules cylindrical, acute.

Hab.—Rather rare in open places of the tropical forests of South Andaman.—Fl. Apr.—l.—SS. = SiS.

2. **C. pruniflorum,** Kz. (*C. prunifolium,* Dyer, H.f. Ind. Fl. i. 258).—A tree (20—25 + 6—10 + 1—½), shedding leaves in HS., all younger parts pubescent; stem dark brown, armed with long sharp spine-like reduced branchlets; bark brown, peeling off in irregular flakes, longitudinally cracked, about 2 in. thick; cut dry, brown; leaves linear-oblong (while young obovate to obovate-oblong), on short, but slender tomentose petioles, obtuse or acute and sometimes almost unequal at base, 4-5 in. long, chartaceous, above rough from a very short tomentum, beneath shortly tomentose with prominent net-veination; flowers of a lilac colour, on 3 to 4 lin. long tomentose pedicels clustered by 3-5 or sometimes almost cymose and arising from above the scars of the fallen leaves; sepals pale tawny tomentose; petals fimbriate, with a basal scale; glands oblong, terete, blunt; staminal bundles flat, rather broad towards the base, the filaments free from above their middle and fringing; capsules oblong, acute.

Hab.—Not unfrequent in the Eng and low forests of Martaban down to Tenasserim; Ava.—Fl. Apr.-May.—l.—SS. = Lat.

Remarks.—Wood rather heavy, fibrous, but close-grained, soft, pale reddish-brown, rather perishable and soon attacked by *xylophages.*

3. **C. polyanthum,** Korth.; H.f. Ind. Fl. i. 257.—A tree (30—40 + 10—25 + 2—4), leafless in HS., the stem fluted, all parts

glabrous ; bark dark brown, corky lamellate, about 2 lin. thick; cut yellowish ; leaves oblong or oblong-lanceolate, 3 to 3½ in. long, acute or rounded at base, on a very short petiole, more or less acuminate, membranous, glabrous, glaucescent beneath ; flowers small, pink, on very short pedicels, usually by 3 (rarely solitary) in axillary cymes on a slender about ½ in. long glabrous peduncle ; sepals elliptical, blunt, coriaceous, glabrous ; petals rounded ; hypogynous glands present or wanting ; staminal bundles flat, the filaments free from above their middle and fringing ; capsules oblong, acute, longer than the calyx.

Hab.—Rather frequent in the hill, Eng, and drier upper mixed forests, from Martaban and Tenasserim down to the Andamans.—Fl. March-Apr.; Fr. C. S.—l.—SS. = Lat., *Metam.*, SiS.

Remarks.—Wood rather heavy, brown or pale brown, with darker-coloured heartwood, fibrous, but close-grained ; takes fine polish.

4. **C. neriifolium,** Kz. ; H.f. Ind. Fl. i. 257.—*Bai-bya.*—A tree (40—50 + 12—20 + 2—3), shedding leaves in HS., all parts glabrous ; bark dark brown or blackish, rough, longitudinally and deeply cracked ; cut dry, brown ; leaves lanceolate to oblong-lanceolate, about 4 in. long, very shortly petioled or almost sessile, almost sagittate at base, acute or bluntish, glabrous, pale and distinctly net-veined beneath ; flowers small, crimson (?), on very short pedicels, by 3 or 2 in poor shortly peduncled cymes and forming rather long quite glabrous terminal panicles ; sepals oblong, blunt, coriaceous, glabrous ; petals about 3-4 lin. long, rounded ; staminal bundles flattened, the filaments free from about their middle ; hypogynous glands as long as the ovary, fleshy, club-shaped, blunt ; capsules a little longer than the sepals, ovate.

Hab.—Frequent in the drier, upper mixed and dry forests, less so in the lower mixed ones, all over Burma from Ava and Chittagong down to Tenasserim.—Fr. Jan.-Febr.—l.—SS. = ∞ *CaS.*, *SiS.*, *Metam.*

Remarks.—Wood rather heavy, brown, close-grained, rather soft. Used for building purposes, ploughs, handles of chisels, hammers and other utensils.

5. **C. arborescens,** Bl. ; H.f. Ind. Fl. i. 258.—An evergreen large shrub, all parts glabrous ; leaves obovate-oblong to oblong-lanceolate, acute at base, on a 2-3 lin. long petiole, apiculate or shortly and bluntish acuminate, 2-3 in. long, coriaceous, glabrous, pale beneath ; flowers small, scarlet, on a line long pedicels racemulose, forming quite glabrous panicles in the axils of the upper leaves and at the end of the branches ; sepals glabrous, about 3 lin. long, concave-oval, blunt ; petals somewhat longer, rounded, gland-dotted ; capsules ovate, acute, somewhat longer than the sepals.

Hab.—Tenasserim.

GUTTIFERÆ.

Flowers regular, dioecious, polygamous, or hermaphrodite. Sepals 2-6, imbricate. Petals as many, rarely more, imbricate or almost twisted. Male flowers: stamens usually indefinite, hypogynous; filaments free or united into bundles; anthers various. Female flowers: staminodes various. Ovary 1-2-or more-celled, with one or more ovules in each cell; stigmas as many as ovary-cells or variously consolidated, sessile or on a longer or shorter style. Fruit usually an indehiscent berry with a fleshy or pulpy mesocarp. Seeds large. Albumen none. Cotyledons either small and the radicle large, or thick and large, and the radicle very short.—Trees or shrubs often abounding in a yellow juice, with opposite simple often coriaceous leaves. Stipules none. Flowers axillary or terminal, solitary, clustered, in racemes or panicles.

The yellow acrid gum-resin called gamboge comes chiefly from a *Garcinia*, and some Burmese species may yield a substitute for. The seeds of several *Calophylla* yield oil. All the Burmese species are woody.

* Stigma sessile, or on a short and thick style. Cotyledons minute or none, the radicle large and solid.

Calyx of 4 or 5 imbricate sepals . . . . . *Garcinia.*
Calyx closed in bud, bursting into 2 valves . . . . *Ochrocarpus.*

* * Style slender, single, or rarely 2. Cotyledons large and fleshy, free or consolidated, the radicle small.

Ovary 1-celled, 1-ovuled; stigma peltate . . . . . *Calophyllum.*
Ovary 1-celled, 4-ovuled; stigma 4-cleft . . . . . *Kayea.*
Ovary 2-celled, 4-ovuled; stigma peltate . . . . . *Mesua.*

GARCINIA, L.

Flowers dioecious or polygamous. Sepals 4 and decussate, or rarely 5 or 6 and imbricate. Petals 4 or 5, imbricate. Males: stamens numerous, free or united in an entire or lobed fleshy mass, or 4-adephous round a style-rudiment; anthers 2-or rarely 4-celled. Females and hermaphrodites: staminodes various, free or connate. Ovary 2-or more-celled with a solitary ovule in each cell; stigma sessile, or on a short style, entire, lobed or radiating. Fruit a 2- or several-celled berry with a coriaceous rind. Seeds imbedded in the arillus-like pulp.—Trees, rarely shrubs, with coriaceous rarely fleshy-membranous simple leaves. Flowers solitary, fascicled, or rarely in panicles.

* *Flowers 4-merous.*

○ Anthers oblong or ovate, opening by longitudinal slits or pores.

× Stamens of male flowers in 4 bundles under the rudimentary ovary. Ovary 4-10-celled; stigma radiating-lobed or peltate, smooth or nearly so.

△ Stigma sessile, radiating-lobed.

Female flowers with staminodes round the ovary; berries on a short peduncle . . . . . *G. mangostana.*

△ △ Stigma peltate.

Female flowers without staminodes; berries sessile . . . *G. cornea.*

Flowers on rather long peduncles, nearly 2 in. across . . . *G. speciosa.*

× × Stamens in 4 polyandrous bundles in a ring round the rudimentary ovary. Stigma peltate, discoid, more or less rough from wrinkles or radiating veins. Ovary 2-celled.

△ Peduncles with 2 or rarely a single leafy bract, rather long . . . . . *G. anomala.*

△ △ Peduncles naked. Flowers in brachiate poor cymes or small panicles.

Leaves long-acuminate, the lateral nerves remote and irregular; staminal mass deeply 4-lobed . . . . . *G. Merguensis.*

Leaves blunt-caudate, the lateral nerves crowded, very faint and regularly parallel . . . . . *G. rostrata.*

× × × Anthers almost sessile on a column or 4-sided or rarely lobed fleshy mass. Staminodes in female flowers in a single, complete, or interrupted ring, or none. Stigmas tubercled or tubercled-wrinkled, rarely smooth. Ovary 4-12-celled.

† Stigma raised on a short thick style.

Berry convex at top, the style direct from the apical depression, anthers 4-celled . . . . . *G. cowa.*

Berry terminated by a nipple-shaped protuberance; anthers 4-celled *G. Kydia.*

† † Stigma quite sessile.

† Male and female flowers solitary to ternary.

‖ Stigma minute, dot-like, smooth anthers 2-celled . . . . *G. microstigma.*

‖ ‖ Stigma tubercled or tubercled-wrinkled.

Leaves acuminate or cuspidate, leathery; flowers sessile; anthers 4-celled . . . . . *G. lanceæfolia.*

Leaves blunt, succulent, when dry thin herbaceous; flowers pediceled; anthers 2-celled . . . . . *G. succifolia.*

† † Male flowers panicled, the females in terminal spikes . . . *G. paniculata.*

○ ○ Anthers peltate, opening by a circular slit.

Leaves large, coriaceous; female flowers almost sessile, the stigma small, verrucose . . . . . *G. elliptica.*

∗ ∗ *Flowers 5-merous.*

Pedicels about an in. long; petals expanded . . . . *G. Xanthochymus*

Pedicels 3-4 lin. long; petals almost closed, doubled, smaller . *G. dulcis.*

∗ *Flowers 4-merous.*

1. **G. mangostana,** L.; H.f. Ind. Fl. i. 260.—*Meng-kope.*—An evergreen tree 40—50 + 15—30 + 3—5, all parts glabrous; leaves oblong or oblong-lanceolate, 7-9 in. long, on a short and thick petiole, rounded or obtuse at base, firmly coriaceous, bluntish acuminate or acute, glossy; flowers about 2 in. in diameter, the males on a rather long peduncle, terminal by 3, 5 or 9, reddish yellow; stamens collected in a shortly 4-lobed fleshy mass round the abor-

tive conical ovary, which is terminated by a 4-cornered stigma; female hermaphrodites solitary or rarely by 3, peduncled, larger than the males, reddish; filaments slender and free, many surrounding the ovary; ovary globular, 6- 8-celled, the stigma sessile, adnate peltate, radiately 5-8 lobed; berry spherical, the size of a small orange, crimson brown to almost brick-coloured, smooth, several-seeded, the seeds enveloped in a snow-white delicious tasting sappy mesocarp.

Hab.—Cultivated in Tenasserim.—Fr. May-June.—s.

Remarks.—Exudes gamboge of inferior quality. The fruits are a much esteemed table-desert.

2. **G. cornea,** L.; H.f. Ind. Fl. i. 260.—An evergreen tree (40—60 + 10—30 + 3—6), all parts glabrous; bark about ¼ in. thick, receding in convex pieces; cut milky, the milk soon yellow; leaves broadly oblong to oblong-lanceolate, acute at base, rather long-petioled, 6-7 in. long, shortly and bluntish acuminate or apiculate, coriaceous, glabrous; flowers nearly an in. in diameter, pale-yellow, the males on 3 to 4 lin. long peduncles and terminal by 3 to 9, the females sessile, solitary and terminal; males: stamens numerous, almost sessile on a fleshy 4-lobed mass; abortive style terminated by a large sticky yellow gland; females: stamens none; ovary ovate, 4- or 6-celled; style very short and thick; stigma large and flat, 4- or 6-lobed, covered by sticky glands; berry nearly oval, the size of a pigeon's egg, somewhat tapering at apex, dark purple, containing 4-6 seeds in a pleasantly subacid white pulp; stigma large, peltate.

Hab.—Not uncommon in the tropical forests of Martaban and the southern slopes of the Pegu Yomah above Rangoon; also Tenasserim.—Fr. Begin. of RS.—s.—SS. = Metam., Lat. p.

Remarks.—Wood brown or red-brown, heavy, of a coarse unequal fibre, hard, rather close-grained. Yields an inferior sort of gamboge.

3. **G. speciosa,** Wall.; H.f. Ind. Fl. i. 260.—An evergreen tree (40—50 + 20—30 + 3—5), all parts glabrous; leaves oblong or oblong-lanceolate, on a thick petiole about an in. long, acute at base, 8-9 in. long, bluntish acuminate, coriaceous, glabrous, the nerves beneath very conspicuous; flowers 1½-2 in. in diameter, yellow, fragrant, the males on rather long peduncles, by 4-5 fascicled and terminal, the females unknown; stamens very numerous, the ovate anthers almost sessile on the fleshy 4-lobed mass round the short and thick abortive style which is terminated by a yellow convex orbicular-peltate large stigma; unripe berries ovoid, supported by the large sepals; stigma large, peltate, orbicular, obsoletely 4-lobed.

Hab.—Frequent in the tropical forests of the Andamans; also Tenasserim.—Fl. Febr.-Apr.—s.—SS.=Serpentine and chloritic rocks.

Remarks.—Wood uniformly reddish-brown, very heavy, close-grained, in quality equal to the Andaman bullet-wood. Yields inferior gamboge.

4. **G. anomala,** Pl. & Trian.; H.f. Ind. Fl. i. 266.—An evergreen tree (30—40 + 10—15 + 3—5), all parts glabrous; leaves oblong to oblong-lanceolate, at both ends acuminate, on a strong 6-8 lin. long petiole, 6-7 in. long, glabrous, shining above, drying pale-green; flowers rather large, more than an in. in diameter, yellowish, on very short and thick pedicels, forming a 3 or few-flowered cyme on an axillary 5-8 lin. long peduncle furnished with 2 (rarely 1) leafy large bracts; males: stamens numerous, collected in 4 fleshy erect bundles confluent at base round the cylindrical ovary-rudiment which is crowned by a pileus-like stigma; anthers horse-shoe-shaped; females like the males; stamens numerous, the filaments united in a broad ring round the ovary and hardly interrupted; anthers abortive; ovary 2-celled, crowned by a sessile, discoid, striate, crenulate stigma; berry oval, the size of a cherry, smooth, with a small roughish crenulate stigma; seeds usually solitary.

Hab.—Not uncommon in the damp and drier hill-forests of Martaban, east of Tounghoo, at 4,000 to 6,000 ft. elevation.—Fl. Apr.-May.—s.—SS. = Metam.

Remarks.—Sapwood white, soft. Yields inferior gamboge.

5. **G. rostrata,** Bth. & H.f.—A large evergreen tree, all parts glabrous; leaves elliptical to elliptically lanceolate, long and bluntish caudate, acuminate at the base, on a 1½-2 lin. long petiole, 2-3 in. long, coriaceous, glabrous, the lateral nerves very faint, numerous, close, and pretty regularly parallel; female flowers only known, on stout, rigid, 4-cornered pedicels 3-4 lin. long, forming brachiate, short, simple, or more usually from the base branched poor cymes in the axils of the leaves; sepals about 2 lin. long, concave oval, the 2 outermost ones minute and thick; petals concave rotundate, nearly 3 lin. long; ovary minute, perfectly overtopped by the large peltate-hemispherical stigma; berries (unripe) ovoid-globose, the size of a small cherry, smooth, crowned by the large circular viscose stigma.

Hab.—Southern Tenasserim (accord. H.f.)

6. **G. Merguensis,** Wight.; H.f. Ind. Fl. i. 267.—An evergreen tree, all parts glabrous; leaves oblong-lanceolate to ovate-oblong, shortly petioled, acute at base, 4-5 in. long, apiculate or bluntish acuminate, thinly coriaceous, glossy and glabrous; flowers about 5 to 4 lin. in diameter, on rather slender pedicels, the males forming by 3 or rarely 5-9 poor cymes on very short peduncles usually arising singly from the axils of the leaves, or if sessile spuriously ternary; sepals orbicular, the outer ones a line long, the inner 2 lin. long and concave; males: anthers almost sessile, 2-celled, densely covering the 4-lobed fleshy staminal mass; ovary reduced to a

globular large body ; female flowers solitary or in pairs, on ½-1 in. long pedicels, axillary ; stigma large, fungoid ; berries oblong, ½-⅔ in. long, fleshy.

HAB.—Tenasserim.

7. **G. cowa,** Roxb.—An evergreen middling-sized dioecious tree, all parts glabrous ; leaves broadly to elliptically lanceolate, at both ends acuminate, 2-3 in. long, the lateral nerves irregular and apparently strongly prominent ; flowers rather small, yellow, the male ones smaller (about ⅓ in. across), rather slenderly pediceled, in dense terminal clusters, the females ½ in. in diameter or somewhat larger, pedicelled, solitary, or by 3-5 at the end of the branchlets ; sepals concave-oval, 2-3 lin. long ; petals in males about so long as the sepals, in the females somewhat longer and larger ; males : anthers numerous, 4-cornered-oblong, 4-celled, on very short filaments, crowded on the 4-cornered fleshy staminal mass : ovary-rudiment minute ; females : staminodes forming 5 or 10 connate filaments ending into a gland and forming an interrupted ring round the ovary ; stigma stellately and densely 6-8-lobed, the lobes crenate ; berry the size of a lime, slightly 6-8-lobed, but not truly torulose, dull red, somewhat depressed at the apex, and here bearing a small sessile deeply 6-8-cleft stigma, the mesocarp reddish-yellow. —(From Roxburgh's Fl. Ind. and MS. drawings.)

HAB.—Chittagong.—Fl. Febr. ; Fr. June.

REMARKS.—Yields an inferior sort of gamboge.

8. **G. Kydia,** Roxb.—*Toung-tha-lai.*—An evergreen tree (50—70 + 20—30 + 5—6), all parts glabrous ; the branches all drooping, all parts glabrous ; bark ⅓ in. thick, blackish-brown, rough and cracked ; cut brown, exuding a yellow milk ; leaves from ovate-oblong to oblong-lanceolate, acuminate at both ends, 4-5 in. long, on rather long and slender petioles, almost coriaceous, glabrous and glossy, the nerves thin ; flowers yellow or reddish-yellow, about 6-8 lin. in diameter, on short and thick glabrous clavate pedicels, forming a poor cluster on a very short (hardly ¼ lin. long) peduncle or sessile in the axils of the leaves or terminal, the females solitary, sessile, terminal and lateral ; petals very thick, at the base concavely hollowed out ; males : anthers numerous, on very short filaments, 4-celled, densely arranged on a fleshy almost 4-cornered mass ; staminodes 4, filiform, unequally 2-3-cleft, the branches gland-tipped, ovary globular, 6-8-celled ; stigma sessile, 6-8-lobed, granular-fleshy ; berry the size of a small lime, globular-ovoid, dark purple-brown, much depressed at the apex terminated by a nipple-shaped protuberance on which the thick and short-styled stigma rests.

HAB.—Frequent in the moister, upper-mixed, and in the tropical forests all over Burma, from Chittagong, Pegu, and Martaban down to Tenasserim and the Andamans.—Fl. March-May; Fr. May-June.—s.—SS. = *SiS*, Metam.

REMARKS.—Wood white, turning yellowish, rather heavy, coarsely fibrous, loose-grained, very perishable. □ ' =42 pd.—Yields inferior gamboge.

9. **G. lanceæfolia,** Roxb.; H.f. Ind. Fl. i. 263.—An evergreen small tree, all parts glabrous; leaves lanceolate to oblong-lanceolate at both ends acuminate, on a slender 3-4 lin. long petiole, 2-3 in, long, thick herbaceous, glabrous; flowers small, purple, solitary. or by 3, on thick 1-2 lin. long pedicels, terminal; sepals rounded,, 2 lin. long; petals somewhat shorter; stamens numerous, in a globose mass; anthers 4-celled; stamens in 4 bundles of 4-5 each; ovary ovoid, the stigma 6-8-rayed, tubercled; berry the size of a small plum, obovoid, orange-yellow, 6- to 8-seeded.

HAB.—Chittagong hills.—Fl. Febr.; Fr. July.

10. **G. microstigma,** Kz.—A simple-stemmed or meagre shrub 4 to 6 ft. high, all parts glabrous; leaves elliptical to elliptically ovate and lanceolate, acute or acuminate at the base, on a petiole about an in. long, bluntish acuminate or apiculate, 3-4½ in. long, coriaceous, the lateral nerves thin and barely visible; flowers middling-sized, reddish, the males on thick glabrous pedicels about 2-3 lin. long, usually by threes, axillary and terminal, the females shorter pediceled and probably solitary and terminal; anthers oblong, 2-celled, sessile, covering the globular torus; sepals concave-oval, blunt, about 2 lin. long or longer, coriaceous; petals almost orbicular, hardly longer than the sepals; berries globose, the size of a wood-apple, with a thin smooth pericarp, glossy, crimson, supported by the sepals, 2- or more (?)-seeded, the stigma very minute, discoid, smooth, sessile, entire.

HAB.—Not unfrequent in the tropical forests of South Andaman.—s.—SS.=SiS., etc.

11. **G. succifolia,** Kz. (*G. loniceroides,* T. And.; H.f. Ind. Fl. i. 264).—An evergreen tree (30—35 + 10—15 + 3—4), all parts glabrous; bark about a line thick, black-brown or blackish, peeling off in convex pieces; cut exuding a yellow milk; leaves lanceolate or oblong-lanceolate, about 2-4 in. long, on a very slender, but rather short red petiole, acute at base, usually blunt or bluntish, succulent and almost fleshy, in a dried state thin membranous, glabrous, glossy, the midrib red; flowers whitish, about 4-5 lin. in diameter, on short thick pedicels, solitary, or by 2 or 3 terminal or in the axils of the leaves; males: the 2 inner sepals larger and of a thinner texture than the petals and veined; stamens numerous; anthers oblong, marginate, flat, 2-celled, almost sessile

on the upper side of the fleshy erect short mass; female flowers, &c., unknown.

Hab.—Frequent in the swamp-forests of the alluvial lands of the Sittang and Irrawaddi Rivers.—Fl. Apr.—s.—SS.=All.

Remarks.—Wood white, turning yellowish-white, rather heavy, coarsely fibrous, very perishable. Yields little and inferior gamboge.

12. **G. paniculata,** Roxb.; H.f. Ind. Fl. i. 266.—A dioecious tree, about 60 ft. high, all parts glabrous; leaves oblong-lanceolate to lanceolate, shortly petioled, rather acute to bluntish, 4-6 in. long or longer, acuminate at the base, coriaceous; flowers middling-sized, white, on 4-cornered pedicels nearly a line long, the males numerous, in peduncled lateral trichotomous glabrous panicles; the females fewer in number, forming short terminal spike-like racemes; sepals broadly concave-cordate, about 1½ lin. long, fleshy; petals 4, ovate to oblong-ovate, concave, 2½-3 lin. long, fleshy; anthers almost sessile, crowded on the large hemispherical fleshy torus; staminodes in females none or represented by 1 or 2 filaments only; ovary ovoid, crowned by the large convex entire glandular-rough stigma; berries almost globose, the size of a cherry, yellow, usually 4-celled and 4-seeded; the stigma rather small, sessile, convex-circular, granular.

Hab.—Chittagong.

13. **G. elliptica,** Wall. (*G. heterandra,* Wall.; H.f. Ind. Fl. i. 265).—*Tha-nat-tau.*—An evergreen tree (40—60 + 10—30 + 3—5), all parts glabrous; bark thin, smooth; leaves from broadly oblong and elliptical to obovate-oblong, acute at base, on a thick petiole, ½ in. long, apiculate or shortly and bluntish acuminate, 8-9 in. long, glabrous, coriaceous, the nerves beneath prominent and rather irregular; flowers solitary, rather small, axillary, the males on very short pedicels, the females almost sessile; anthers peltate, on very short filaments, on a globose central mass, circumsciss-dehiscent; stigma shortly 4-lobed; berries globular or ovoid globular, almost an in. thick, smooth, 4-celled; the stigma small, hemispherical, wrinkled.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and of Martaban, up to 3,000 ft. elevation; also Tenasserim.—Fr. Febr.—s.—SS.=SiS., Metam.

Remarks.—Wood soft, white. Yields a superior quality of gamboge.

* * *Flowers 5-merous.*

14. **G. dulcis,** Kz.—An evergreen tree (30—40 + 10—15 + 3—4), polygamous, all parts glabrous; leaves oblong to ovate-oblong, on a rather short and thick petiole, obtuse or rounded at base, 8-12 in. long, shortly acuminate, coriaceous, glossy; flowers rather large,

yellow, half-closed and almost globular, on 3-4 lin. long pedicels, arising by 6-8 from short thick warts; sepals usually 5, rarely 4 or 6; the 5 staminal bundles of the hermaphrodite flowers slender, bearing 6-8 twin anthers on short thick filaments alternating with 5 scale-like truncate glands; ovary ovate; stigma sessile, bluntish, 5-lobed; berry the size of a lime, globular or oval, smooth, bright yellow, containing 5-1 large seeds in a yellow fleshy axillus-like pulp.

HAB.—Rather frequent in the tropical forests of South Andaman and adjacent islands.—Fl. March-May; Fr. May-June.—s.—SS.=SiS.

15. **G. Xanthochymus,** H.f. Ind. Fl. i. 269 (*Xanthochymus pictorius,* Roxb.; Bedd. Sylv. Madr. t. 88.)—*Ma-taw.*—An evergreen tree (40—50 + 12—20 + 3—5), all parts glabrous; bark 2-3 lin. thick, rather smooth, blackish or dark grey; cut pale-coloured, milky, the milk soon turning yellow; leaves oblong-lanceolate to elongate-oblong, shortly acuminate, $\frac{3}{4}$-$1\frac{1}{2}$ ft. long, on a rather long and thick petiole, acute or obtuse at base, coriaceous, glabrous; flowers yellow, expanded, about an in. in diameter, on about an in. long strong pedicels arising in fascicles from short thick warts; sepals and petals 5, rarely and only occasionally 4, and then often the 5th sepal disarranged and scale-like; staminal bundles of the hermaphrodite flowers alternating with the petals and scale-like glands, bearing on the truncate apex 4 anthers on slender short filaments; berries as large as an orange or lime, almost oval, apiculate, deep yellow, containing 3 to 5 large seeds imbedded in a yellow arillus-like pulp.

HAB.—Rather frequent in the tropical forests of Martaban and Pegu; also Chittagong, Arracan, and Tenasserim; Ava.—Fl. March-Apr.; Fr. R. S.—s.—SS.=Metam. SiS.

REMARKS.—Wood yellowish-white with a darker coloured large heart-wood, turning pale yellowish-brown, rather heavy, fibrous, but close-grained, rather hard. Yields gamboge of inferior quality.

OCHROCARPUS, Thouars.

Calyx closed before flowering, at length rupturing into 2, rarely 3, valve-like sepals. Petals 4-7 or more. Stamens indefinite; filaments free or connate at base; anthers dehiscing vertically. Ovary 2-celled, with 2 ovules in each; style short; stigma 2-lobed. Berry 1-4-seeded. Cotyledons minute or none, the radicle large and fleshy.—Trees, with simple leaves and axillary polygamous flowers.

Leaves blunt or retuse, minutely lacunose-reticulate, the lateral nerves not visible; filaments longer than the anthers . . . *O. Siamensis.*

Leaves acuminate, laxly and strongly reticulate, the lateral nerves strong and anastomosing; flowers small, filaments shorter than the anthers . . . . . *O. nervosus.*

1. **O. Siamensis,** T. And.; H.f. Ind. Fl. i. 270.—*Ta-la-pee* or *tarapee.*—An evergreen tree, about 20 to 25 ft. high, all parts glabrous; leaves oblong-lanceolate, narrowed at base, on a short and thick petiole blunt or retuse, 4-6 in. long, coriaceous, glabrous, prominently nerved and net-veined; flowers about 8-10 lin. in diameter, white, fragrant, on an in. long rather slender pedicels usually fascicled or rarely by 2 or solitary in the axils of the leaves or from above the scars of the fallen ones; males: sepals 2, herbaceous, broadly oblong; petals broadly oblong-lanceolate, blunt or nearly so, c. 3-4 lin. long; anthers numerous, on elongate filaments; berries ovoid, mucronate, 1¼ in. long, glabrous.

Hab.—Rather rare in the Eng forests of Martaban; also Prome hills. Fl. Sept.-October.—l.—SS.=Lat. CaS.

2. **O. nervosus,** Kz.—An evergreen tree (40—50 + 10—15 + 3—5), all parts glabrous; leaves oblong to linear-oblong, acute at the base, on a thick petiole ½-⅔ in. long, acuminate, 5-7 in. long, coriaceous, glabrous, the lateral nerves rather irregular and thin, but prominent and distinctly anastomosing near the margin, strongly and laxly net-veined; flowers small, white, on slender-straight, glabrous pedicels about an inch long, arising by 3-7 from above the scars of the fallen leaves; calyx glabrous, 2 lin. long, rupturing into 2 or 3 sepals; petals 6, as long or shorter than the sepals, obovate-oblong; stamens numerous, on filiform filaments shorter than the anthers; ovary globose, glabrous, narrowed in a short thick shortly 2-lobed style.

Hab.—Tropical forests of the Arracan Yomah.—Fl. H.S.

CALOPHYLLUM, L.

Flowers polygamous. Sepals and petals together 4 to 12, imbricate in 2 or 3 series. Stamens numerous, free or nearly so; anthers 2-celled. Ovary 1-celled, with a single erect ovule: style rather long; stigma peltate. Drupe indehiscent, crustaceous, 1-seeded.—Trees, with coriaceous beautifully parallel-veined leaves. Flowers white, fragrant, in cymes or panicles.

* *Sepals 4, often the 2 inner ones or all petal-like; petals none.*

Flowers about 8 lin. in diameter, in peduncled or almost sessile umbel-like cymes . . . . . *C. spectabile.*
Flowers small; racemes short and strong, few flowered . . . *C. amœnum.*

** *Sepals 4; petals 4-8.*

Leaves at both ends acuminate . . . . . *C. polyanthum.*
Leaves rounded or retuse at apex . . . . . *C. Inophyllum.*

1. **C. spectabile,** Willd.; H.f. Ind. Fl. i. 271.—*Pan-ta-ka.*—An evergreen tree (50—60 + 25—30 + 4—6½), the leaf-buds rusty tomentose; branchlets sharply 4-6-cornered or almost terete; leaves

large, 7-10 in. long, narrowly or broadly oblong to almost ovate-oblong, acute or obtuse at base, on a thick petiole 7-6 lin. long, acute or shortly acuminate, when full grown often bluntish apiculate or blunt, undulate, chartaceous, while young beneath along the midrib slightly woolly; flowers about 8 lin. in diameter, white, on 6-8 lin. long, slender, glabrous pedicels usually by 3-5, forming an umbel-like cyme on a short or almost reduced peduncle; sepals 4, obovate-orbicular, all petal-like and white; petals none; stamens numerous; style long and slender; berries ovate-oblong, the size of a cherry-stone.

Hab.—Not unfrequent in the tropical forests of the Andamans; also Tenasserim.—s.—SS.=chloritic and serpentine rocks.

Remarks.—Wood reddish-brown, heavy and rather close-grained. Good for masts, spars, &c.; answers well for flooring and planks.

2. **C. amoenum,** Wall.—An evergreen tree, the young shoots covered with a short tawny or rusty-coloured tomentum; leaves small, 2-3½ in. long, broadly to oblong-lanceolate or obovate-elliptical, more or less acute at base, on (while young) rusty-tomentose petiole ½ in. long, acute or shortly acuminate, rarely apiculate or occasionally blunt, glabrous, rigidly coriaceous; flowers about 4-5 lin. in diameter, on thick 4-5-lin. long usually thinly rusty-lepidote glabrescent pedicels forming a short at least at base rusty-tomentose raceme of the length of the petiole or somewhat longer; sepals slightly tawny-scurvy, obovate-oblong, about 2-2½ lin. long; petals none; stamens in hermaphrodite flowers few; ovary glabrous; style rather long; berries the size and shape of a large pea, stylose-apiculate, pruinous.

Hab.—Tenasserim.—Fr. Febr.—s.

3. **C. polyanthum,** Wall.; H.f. Ind. Fl. i. 274.—An evergreen tree (40—50 + 15—30 + 3—5), the leaf-buds minutely tawny pubescent; leaves oblong-lanceolate or lanceolate, 4-7 in. long, narrowed at base, on rather thick sharply-bordered petioles ½ in. long, bluntish acuminate or apiculate, coriaceous; flowers about ½ in. in diameter, on slender ½ in. long pedicels, forming large racemes in the axils of the upper leaves and often forming large terminal or axillary panicles; sepals unequal, the outer 2 hardly half the size of the inner ones; petals 4, broadly obovate; stamens numerous; filaments short; berries almost globular, the size of a cherry.

Hab.—Not unfrequent in the damp hill-forests of the Martaban hills, east of Tounghoo, at 3,000 to 4,000 ft. elevation.—SS.=Metam.

4. **C. Inophyllum,** L.; H.f. Ind. Fl. i. 273; Bedd. Sylv. Madr. 22.—*Pongnyet.*—An evergreen tree (50—60 + 25—30 + 6—14), the leaf-buds sparingly tawny velvety; bark blackish-brown; leaves elliptical to broadly obovate and obovate-oblong, usually acute

at base, on a rather strong petiole nearly an in. long, 5-6 in. long, rounded or retuse, firmly chartaceous, glabrous; flowers about an in. in diameter, white, fragrant, on slender about an in. long glabrous pedicels forming axillary glabrous racemes of the length of the leaves or somewhat shorter; the 2 inner sepals petaloid; petals 4, rarely 6-8; berries the size of a bullet, globular.

Hab.—Frequent along the sandy sea-shores, in the beach jungles of the Andamans and Tenasserim; often also cultivated in villages.—l.—SS.=Aren.

Remarks.—Wood reddish-brown, broadly striate, rather close-grained, heavy, □′=63 pd.—Good for masts, spars, railway sleepers, machinery, &c.

KAYEA, Wall.

Flowers hermaphrodite. Sepals and petals 4 each, imbricate. Stamens numerous, free or connate at base; anthers almost globular, 2-celled, dehiscing vertically. Ovary 1-celled with 4 erect ovules; style slender, terminated by a 4-cleft stigma. Fruit almost drupaceous, fleshy, indehiscent, 1-4-seeded.—Trees, with simple leaves and solitary or panicled flowers.

Flowers in terminal panicles . . . . . *K. floribunda.*
Flowers by 1-3 in the leaf-axils and terminal . . . . *K. nervosa.*

1. **K. floribunda,** Wall.; H.f. Ind. Fl. i. 276.—A large evergreen tree (60—80 + 35—40 + 4—5), all parts glabrous; leaves oblong to linear-oblong, on a slender petiole about an inch long, acuminate, 5-8 in. long, coriaceous, smooth, the lateral nerves beneath arched and prominent; flowers white, about an inch across, on strong pedicels furnished with 2 bisal bractlets, forming a stout, but lax glabrous panicle at the end of the branches and branchlets; sepals almost orbicular; petals little longer than the sepals, white with rosy edges; anthers golden-yellow; drupes the size of a cherry, 1-seeded, covered by the thick, wrinkled, yellow, much-enlarged sepals.

Hab.—Rather rare in the tropical forests of the Martaban hills east of Tounghoo, at about 2,500 to 3,000 ft. elevation.—SS. = Metam.

2. **K. nervosa,** T. And.; H.f. Ind. Fl. i. 277.—An evergreen tree, all parts glabrous, the branchlets tubercled-rough; leaves oblong to elliptically oblong, shortly petioled, rounded or slightly emarginate at base, 2-4 in. long, abruptly acuminate, glabrous, thinly, but rigidly coriaceous; flowers 1¾ in. in diameter, on a tubercled 1-2 in. long pedicel, solitary, or by 2-3 in the axils of the leaves or at the end of the branchlets; outer sepals ¼ in. long, thick and coriaceous, almost orbicular, the inner nearly twice as long; petals cuneate-obovate; drupes almost globular, the size of a cherry, leathery, supported by the somewhat enlarged coriaceous calyx.

Hab.—Tenasserim.—Fr. Apr.

MESUA, L.

Flowers polygamous or hermaphrodite. Sepals and petals 4 each, imbricate. Stamens numerous, free or connate at base; anthers oblong, 2-celled, dehiscing vertically. Ovary 2-celled, with 2 erect ovules in each cell; style long, with a peltate stigma. Drupe woody, 1-celled by maceration of the cell-walls, 1-4-seeded.—Trees, with rigidly coriaceous almost veinless leaves. Flowers large, axillary, solitary or clustered.

1. **M. ferrea**, L.; H.f. Ind. Fl. i. 277; Bedd. Sylv. Madr. 23.—*Gangaw.*—An evergreen tree (50—60 + 20—30 + 6—7), all parts glabrous; leaves very variable in size, usually 3½-5 in. long, lanceolate or oblong-lanceolate, acute or obtuse at base, on a 4-5 lin. long petiole, sharply or bluntish acuminate, rigidly coriaceous, glabrous, glossy above, beneath covered with a white mealy substance or rarely altogether glabrous; flowers large, 2-3 in. in diameter, pure white, on shorter or longer (4-6 lin. long) usually densely puberulous pedicels, jointed at the insertion of the short, rarely elongate peduncle, rarely sessile, solitary, or rarely by 2 or 3 in the axils of the leaves and terminal; sepals velvety, enlarging and turning almost glabrous; petals broadly obovate; drupes the size of a pigeon's egg, ovate, acuminate, striate, usually 1- rarely 2-4-seeded.

Hab.—Frequent in the tropical forests of the Andaman Islands and all over Tenasserim; also Chittagong.—Fl. March; Fr. May-June.—s.—SS.=Metam. SiS.

Remarks.—Wood reddish-brown, the sapwood of lighter colour, close-grained; very heavy, hard, much resembling the Andaman bullet-wood. □′=69 pd. Suitable for machinery, railway sleepers, also for carpentry; used chiefly for helves and handles of tools, gunsticks, &c.

TERNSTROEMIACEÆ.

Flowers hermaphrodite or rarely unisexual. Sepals 5, rarely 4-7, free or slightly connate, imbricate. Petals 5, rarely more, free or connate at base, imbricate or twisted. Stamens numerous, rarely few, free or connate, often adnate to the base of the petals; anthers basifix or versatile, opening by slits or rarely by apical pores. Ovary free or half-inferior, 3-5-celled, with 2 or more not orthotropous ovules in each cell; styles free or connate with usually small stigmas. Fruit a berry or capsule, few- or many-seeded. Albumen none or scanty, rarely copious. Embryo straight or horse-shoe-shaped.—Trees or shrubs, rarely climbing, with alternate simple often coriaceous leaves. Stipules none. Flowers various, often showy, usually supported by 2 sepal-like bracts, solitary or collected in various terminal and axillary inflorescences.

* *Anthers basifix. Seeds usually few.*
○ Fruit inferior . . . . . *Anneslea.*
○ ○ Fruit superior.
× Anthers pilose.
Stamens many; seeds numerous . . . . . *Adinandra.*
Stamens 10-13, ovules by pairs in each cell . . . . . *Sladenia.*
× × Anthers glabrous.
Ovules 2-4 in each cell; seeds large . . . . . *Ternstroemia.*
Ovules many; seeds small . . . . . *Eurya.*
* * *Anthers versatile.*
○ Albumen copious. Cotyledons shorter than the radicle. *Saurauja.*
○ ○ Albumen scanty or none. Cotyledons longer than the radicle.
× Capsule dehiscent.
Sepals almost equal. Radicle inferior; seeds winged . . . *Schima.*
Sepals very unequal. Radicle superior; seeds winged . . . *Gordonia.*
Sepals very unequal; seeds large, not winged . . . . *Camellia.*
× × Drupe indehiscent . . . . . *Pyrenaria.*

ANNESLEA, Wall.

Sepals 5, connate into a fleshy much-enlarging tube. Petals 5, connate. Stamens many; anthers long apiculate. Ovary adnate to the calyx-tube, 3-celled, with many pendulous ovules in each cell; style 3-cleft. Fruit a fleshy-coriaceous berry, crowned by the sepals. Seeds oblong. Albumen fleshy.—Evergreen trees, with thick leathery leaves. Flowers axillary.

Leaves less coriaceous, bluntish, the nerves distinct; peduncles slender . . . . . *A. fragrans.*
Leaves thick coriaceous, acute; nerves almost obsolete; peduncles very thick . . . . . *A. monticola.*

1. **A. fragrans,** Wall.; H.f. Ind. Fl. i. 280.—An evergreen tree (25—30+10—15+1½—2), all parts quite glabrous; bark grey; leaves crowded at the end of the branchlets, oblong- or broadly-lanceolate, on a long and rather slender petiole, acutely decurrent at base, 4-5 in. long, shortly and bluntish acuminate, coriaceous, obsoletely crenate, beneath blackish dotted, the nerves very thin, but still distinct on both sides; flowers furnished at base with 2 bracts, rather large, on c. 3 in. long very slender white pedicels arising by 1-3 from the top of the branchlets; sepals coriaceous, white; corolla white or rose-coloured at the tip; berry the size of a cherry, globular, crowned by the large persistent sepals.

Hab.—Not unfrequent in the Eng- and hill Eng-forests of Pegu, Prome, and Martaban, up to 2,000 ft. elevation; also Tenasserim.—Fl. March-Apr.—l.—SS.=Lat.

Remarks.—Wood pale-brown, rather heavy, close-grained, of a short fibre hard, and rather brittle.

2. **A. monticola,** Kz.—An evergreen tree (50—60+15—25+4—6), remaining stunted in the higher regions, all parts glabrous; leaves about 3 (in young plants up to 7) in. long, ovate or ovate-oblong, rarely lanceolate, rounded or obtuse and a little decurrent at

base, on a rather short, broad petiole, acute or acuminate, entire or obsoletely crenate, very thick coriaceous, beneath black-dotted, the nerves obsolete; flowers rather large, 2-bracted at base, on about 2 (in fruit 3) in. long, thick, straight, white pedicels arising from the top of the branchlets; calyx coriaceous, white; corolla rose-coloured.

HAB.—Not unfrequent in the drier hill-forests of Martaban at 5,000 to 7,000 ft. elevation; Ava, Kakhyen hills.—Fl. Febr.-March.—l.—SS. = Metam.

TERNSTROEMIA, L.

Flowers hermaphrodite or dioecious. Sepals and petals 5, the latter connate at base. Stamens many; anthers glabrous. Ovary 2-3-celled, with 2 or rarely more pendulous ovules in each cell; style simple or none; stigma lobed or almost entire. Seeds few, arillate.—Evergreen trees or shrubs with entire or crenate-serrate leaves. Flowers usually 2-bracted at base, axillary.

Anthers apiculate; calyx smooth . . . . . *T. Japonica.*
Anthers blunt; calyx wrinkled . . . . . *T. Penangiana.*

1. **T. Japonica,** Thbg.; H.f. Ind. Fl. i. 280.—An evergreen tree (80—90 + 40—50 + 5—7), remaining stunted in higher regions, all parts glabrous; leaves crowded at the end of the branches, broadly to oblong-lanceolate, at base decurrent, on a rather short and thick petiole, 2-3 in. long, bluntish or shortly acuminate, very coriaceous, entire, or while young often obsoletely crenate towards the apex, the nerves beneath obsolete; flowers rather small, pale yellow, on rather short thick nodding pedicels arising singly in the axils of the leaves and from above the scars of the fallen leaves, often somewhat crowded; sepals rather large, smooth; corolla spreading, about 8 lin. in diameter; berry globular, the size and shape of a cherry, supported by the smooth sepals.

HAB.—Common in the damp hill-forests of Martaban at 3,000 to 7,200 ft. elevation; Tenasserim.—Fr. Apr.—s.—SS.=Metam.

2. **T. Penangiana,** Chois.; H.f. Ind. Fl. i. 281.—An evergreen tree (50—80 + 30—40 + 6—7), all parts glabrous; leaves obovate-oblong to obovate, on a rather slender petiole, narrowed and somewhat decurrent at base, 4-5 in. long, shortly and bluntish apiculate, coriaceous, entire; flowers dioecious, whitish, 2-bracted at base, on an ½ to 1 in. long pedicel, arising singly from above the scars of the fallen leaves; petals oval, almost equal; calyx wrinkled, robust; berries globular or ovoid, the size of a small lime, containing usually 2-4 seeds embedded in a red pulp.

HAB.—Not unfrequent in the tropical forests of the Andamans; Tenasserim.—Fr. Apr.-May.—s.—SS. =SiS.; serpentine and chloritic rocks.

SLADENIA, Kz.

Sepals 5, persistent, scarious, imbricate. Petals 5 (very rarely 6), coriaceous. Stamens usually about twice as many as petals; filaments short, dilated; anthers 2-cleft at summit, emarginate at base, minutely hispid on the edges and at the base of back, the cells opening by an apical pore. Ovary 3-celled, with 2 pendulous ovules in each cell, narrowed into the thick very shortly 3-cleft style. Fruit unknown.—Probably trees, with crenate serrate glaucescent leaves. Flowers small, in dichotomous cymes.

1. **S. celastrifolia,** Kz.; H.f. Ind. Fl. i. 281.—Probably an evergreen tree, the young shoots sparingly pubescent; leaves elliptically to obovate-oblong, on a rather long petiole, acute at the base, 3-5 in. long, acuminate, chartaceous, crenate-serrate from the middle, glabrous, becoming glaucescent in drying; flowers small, the lateral ones long-pediceled, those in the forks of the peduncle almost sessile, forming repeatedly dichotomous sparingly puberulous and glabrescent cymes shorter than the leaves; sepals about 2 lin. long, blunt, smooth; petals elliptically oblong, as long as the sepals, blunt; ovary glabrous.

Hab.—Ava, hills to the east of Bhamo.—Fl. Aug.

ADINANDRA, Jack.

Sepals and petals each 5, much imbricate, the latter connate at base. Stamens many, often 1-4-dephous; anthers basifix, pilose. Ovary 3-5-celled, containing numerous ovules in each cell; style simple or usually shortly 3-5-cleft. Berries indehiscent with many small seeds. Albumen fleshy.—Trees or shrubs, with simple, entire or serrate leaves. Flowers white or rose-coloured, solitary or fascicled, axillary.

1. **A. villosa,** Chois.; H.f. Ind. Fl. i. 283.—An evergreen tree (30—40 + 15—20 + 2—4), the younger parts more or less pilose; leaves oblong or elliptically oblong, 4-5 in. long, obtuse or acute at base, on a very short and thick pilose petiole, shortly acuminate, membranous or almost coriaceous, entire or slightly crenate, glabrous above, beneath (especially along the midrib) pubescent; flowers middling-sized, on a 1-1½ in. long hirsute pedicel, solitary and axillary; sepals acute, silky pubescent; petals outside and ovary silky-pubescent.

Hab.—Not unfrequent in the open, especially the Eng forests in the Irrawaddi zone of Pegu; Tenasserim.

EURYA, Thbg.

Flowers usually unisexual. Sepals and petals much imbricate, the latter connate at base. Stamens indefinite, but rarely more than 15, adnate to the base of the corolla; anthers adnate, glabrous. Ovary 3- rarely 2-5-celled, with many ovules in each cell; styles free or united, as many as ovary-cells. Berry containing many angular small seeds. Albumen fleshy.—Small trees or shrubs, with often serrate leaves. Flowers small in axillary clusters, rarely solitary.

* *Leaves serrulate.*
× Leaf-buds quite glabrous. Branchlets marked by decurrent lines . . . . . *E. Japonica.*
× × Leaf-buds pubescent or hirsute; branchlets terete.
Slender pine-like tree; leaves puberulous beneath, acuminate; styles united . . . . . *E. acuminata.*
A bushy round-headed tree; leaves membranous, glabrous or nearly so, bluntish-caudate; styles free . . . . . *E. serrata.*
* * *Leaves entire or serrulate only at summit.*
Young shoots appressed pilose; styles united . . . . *E. symplocina.*

1. **E. Japonica,** Thbg.; H.f. Ind. Fl. i. 284; Bedd. Sylv. Madr. t. 92; Brand. For. Fl. 24.—*Toung-let-hpet.*—An evergreen tree (15—25 + 3—6 + 1—2½), stunted or shrubby, all parts glabrous, the branchlets angular from prominent decurrent lines; leaves from oblong to elliptically-lanceolate, acuminate at both ends, on a very short thick petiole, shortly and bluntish apiculate, serrate, coriaceous, glabrous; flowers small, white, on short glabrous nodding pedicels, in small fascicles or rarely solitary in the axils of the leaves; sepals quite glabrous; style slender, deeply 3- rarely 4-5-cleft, or rarely the styles quite free; berries the size of a pepper-kernel, globular, smooth, mucronate.

Hab.—Frequent in the drier hill-forests of Martaban, at 4,000 to 7,000 ft. elevation; Tenasserim.—Fl. March.—SS.=Metam.

Remarks.—Wood light, pinkish-brown.

2. **E. acuminata,** DC.—An evergreen tree (20—25 + 8—10 + 1½—2), with a slender pyramidal crown, the terete branchlets and all other parts more or less pubescent or puberulous; leaves distichous, oblong-lanceolate to lanceolate, obtuse at base, 4-5 in. long, on a very short thick puberulous petiole or almost sessile, long acuminate, serrate, membranous, glabrous and shining above, beneath (especially along the midrib) puberulous or pubescent; flowers small, white, on nodding short puberulous pedicels, in small axillary clusters or rarely solitary; calyx pubescent outside; ovary pubescent, the styles united, short, free at the summit; berries very small, globular apiculate, while young puberulous.

Hab.- Rather frequent in the drier hill-forests, especially the pine-forests, of Martaban, at 6,000 to 7,200 ft. elevation.—Fl. Febr.; Fr. Apr.—l.—SS. =Metam.

3. **E. serrata,** Bl.—*Toung-let-hpet.*—An evergreen tree (30—40 + 10—18 + 2—3), the branchlets terete, puberulous; bark about 2 lin. thick, grey, almost smooth, longitudinally rimose; cut red; leaves oblong to oblong-lanceolate, usually unequal at the acute base, on a short usually puberulous petiole, acuminate or rather caudate, serrate, more or less membranous, glabrous above, beneath, especially along the midrib, slightly puberulous; flowers small, white, usually solitary, or by 2-3 in the axils of the leaves, on short, nodding, glabrous pedicels; sepals glabrous; ovary glabrous; styles usually 4-5, slender, united; berries the size of a pepper-kernel, globular, glabrous, apiculate.

Hab-—Frequent in the tropical forests of Martaban, up to 2,000 ft. elevation; Ava, Kakhyen hills; also Rangoon district.—Fr. March.—s.—SS. = *Metam.* Lat. p.

Remarks.—Wood heavy, red-brown, close-grained, and brittle.

4. **E. symplocina,** Bl.; H.f. Ind. Fl. i. 284.—A large evergreen shrub, the leaf-buds slightly silk-hairy, the branchlets angular from elevated decurrent lines; leaves from oblong to elliptically and obovate-oblong, acute at base, 4-5 in. long, shortly acuminate, coriaceous, entire or sometimes obsoletely serrate towards the apex, glabrous; flowers small, on hardly a line long glabrous pedicels, clustered in the axils of the leaves or arising from above the scars of the fallen ones; sepals slightly pubescent on the middle, ciliate; styles usually 3, slender, united only at the base; berries globular, apiculate, minutely pustulate.

Hab.—In the damp and drier hill-forests of Martaban, at about 7,000 ft. elevation.—Fl. March.—s.—SS. = Metam.

SAURAUJA, Willd.

Flowers usually hermaphrodite. Sepals and petals 5, much imbricate in the bud, the latter united at base, rarely almost free. Stamens very numerous, adhering to the base of the corolla; anthers versatile, opening by apical pores or short slits. Ovary 3-5-celled, with numerous anatropous ovules in each cell; styles as many, free, or more or less united. Berry 3-5-celled, rarely dry and capsule-like. Seeds small, imbedded in pulp. Albumen copious.—Shrubs or trees, often hirsute, terrestrial or epiphytic, with entire or serrate leaves and axillary often handsome flowers.

* *Calyx densely setose or hispid* . . . . . *S. armata.*
* * *Calyx smooth.*
Leaves pale or tawny mealy-puberulous beneath; peduncles long and slender, scaly; styles 5 . . . . . *S. Punduana.*

Adult leaves glabrous, the midrib puberulous; peduncles short, scaly puberulous; stamens about 50; flowers lazuli-blue . . *S. Roxburghii.*
As former, but leaves finely setose serrate; stamens about 20; flowers said to be white . . . . . *S. tristyla.*
All parts, except upper side of leaves, covered with long tawny or brown spreading hairs; peduncles short, but slender, rusty-hirsute . . . . . *S. macrotricha.*

1. **S. armata,** Kz.—An evergreen tree, 25—30 ft. high, the younger parts covered with appressed, strong, sharp, almost bony scales; leaves broadly obovate or obovate-oblong, obtuse at base, 9-10 in. long, on a very short thick scaly petiole, acute, sharply spiny-serrate, chartaceous, glabrous, on the nerves beneath sprinkled with appressed almost bony scales; flowers nearly 1½ in. in diameter, solitary, on very short and thick densely scaly peduncles arising usually in clusters from above the scars of the fallen leaves; sepals covered by a dense tomentum intermixed with copious stiff appressed scales; ovary and style-base densely villous; styles 5, united at base.

Hab.—Ava, Khakyen-hills.—Fl. Apr.

2. **S. Punduana,** Wall.; H.f. Ind. Fl. i. 287.—An evergreen tree (30—40 + 8—15 + 2½—3½), the younger parts scurfy and scaly, oblong or broadly lanceolate, on a long thick scaly petiole, acute at the unequally narrowed base, 10-12 in. long, acute, serrulate, almost coriaceous, glabrous above, beneath covered with a short tawny or rusty-coloured mealy tomentum, the midrib scaly, the lateral nerves very approximate, parallel-running; flowers middling-sized, on rather long bracted pedicels, forming long-peduncled scaly puberulous often trichotomous cymes; bracts large, broadly ovate; calyx and ovary smooth; styles 5, erect, connate at base.

Hab.—Not unfrequent in the tropical forests of Martaban, at 2,000 to 3,000 ft. elevation; Ava, Kakhyen-hills.—Fl. Apr.—SS.=Metam.

Remarks.—Wood white, soft, even, and finely fibrous.

3. **S. Roxburghii,** Wall.; H.f. Ind. Fl. i. 287.—An evergreen tree (30—40 + 10—20 + 3—4), the younger parts covered with a mealy scurf intermixed with minute scales; leaves obovate-oblong to oblong, obtuse or rounded at the unequal base, on a long thick minutely scaly glabrescent petiole, 8-10 in. long, shortly acuminate or acute, serrulate, chartaceous or almost coriaceous, while young slightly puberulous on the nerves and veins beneath; flowers small, lazuli-blue or rose-coloured, on rather long puberulous pedicels, forming short branched almost sessile or very shortly peduncled rusty puberulous cymes in the axils of the leaves or above the scars of the fallen ones; bracts minute; calyx and ovary glabrous; stamens numerous; styles 3-5, united at base, spreading.

HAB.—Rather frequent in the tropical and damp hill-forests of the Martaban hills, east of Tounghoo, at 2,000 to 6,000 ft. elevation; also Chittagong.—Fl. Apr.-May.—s.—SS.=Metam.

REMARKS.—Wood soft, white.

4. **S. tristyla,** DC.; H.f. Ind. Fl. i. 287.—A shrub or small tree, the bark grey, not spotted; leaves obovate or broadly oblong, 7-10 in. long, on a ½-1½ in. long petiole, acuminate, spiny-serrulate, glabrous on both sides except the scale-like hairs on the nerves and midrib beneath; flowers white, about ½ in. across, on old wood in fascicles of about twice trichotomous cymes; pedicels ¾ in. long, scaly and hairy; sepals obovate, blunt; stamens about 20; styles 3, rarely 5, distinct; berries usually 3-lobed.

HAB.—Tenasserim.

5. **S. macrotricha,** Kz.; H.f. Ind. Fl. i. 287.—A small tree, all parts clothed with long stiff rusty-coloured or black spreading hairs; leaves lanceolate, nearly a foot long or shorter, narrowed at both ends, on a rather short hirsute petiole, sharply acuminate, bristly serrate, chartaceous, glabrous above, beneath, especially along the nerves and veins, sprinkled with stiff hairs; flowers small, on long slender hirsute pedicels, forming short, but slender hirsute cymes axillary or above the scars of the fallen leaves; bracts small, linear-lanceolate, glabrous; sepals and ovary glabrous; styles 5, erect, united at base.

HAB.—Ava, especially in the Kakhyen hills.—Fl. Apr.

PYRENARIA, Bl.

Sepals usually 5, unequal, gradually passing from bracts to petals. Petals united at base, much imbricate. Stamens numerous, all united, or the inner ones free, adnate to the base of the petals; anthers versatile. Ovary 5-celled, with 2 laterally attached ovules in each cell; styles 5, free, or more or less coherent. Fruit an indehiscent fruit. Seeds not winged. Albumen none. Radicle inferior.—Trees, with serrate leaves and almost sessile often showy axillary flowers.

* *Bracts large, leafy, very dissimilar to the sepals.*

Leaves drying yellowish, pubescent beneath . . . . . *P. diospyricarpa.*

** *Bracts small, much shorter than, and almost conform with, the sepals.*

Leaves glabrous, drying yellowish; petioles hardly 2 lin. long; fruits obovate, waxy-yellow . . . . . *P. camelliæflora.*

Leaves glabrous, in a dried state liver-coloured; petioles 6-8 lin. long; fruits globular or elliptical, green . . . . . *P. serrata.*

1. **P. diospyricarpa,** Kz.—An evergreen tree (15—25 + 3—8 + 2—3), stunted, all younger parts pubescent; leaves oblong to elliptically lanceolate, with the margins of the acute base usually invo-

lute, 4-5 in. long, on a rather thick densely pubescent petiole 2-3 lin. long, blunt or nearly so, serrulate, coriaceous, while young on both sides, finally beneath only, densely and shortly puberulous or pubescent, yellowish-green, drying yellowish; flowers middling-sized, on a very short thick pedicel, arising singly from the axils of the leaves; bracts longer than the sepals, leaf-like, oblong-lanceolate, narrowed towards base, and sessile with a very broad imbricate base; sepals similar to the bracts, but much smaller and gradually passing into the petals, the latter densely silky pubescent outside; ovary densely silky-villous; styles 5, free at apex, thick and short; drupes obovate-oblong, the size of a small pear, obsoletely 4-5-lobed, waxy-yellow, supported by the somewhat enlarged bracts and sepals.

Hab.—Not unfrequent in drier and stunted hill-forests of Martaban, at 6,000 to 7,200 ft. elevation.—Fl. Fr. March.—s.—SS.=Metam.

2. **P. camelliæflora,** Kz.; H.f. Ind. Fl. i. 290.—An evergreen tree (25—30+8—15+2—3), the young branchlets densely pubescent; bark brown, longitudinally rimose; cut greenish; wood white; leaves oblong or elliptically oblong, 4-5 in. long, somewhat tapering at both ends, on a puberulous or glabrous petiole hardly 2 lin. long, blunt, crenate-serrate, thin coriaceous, drying yellowish, the midrib beneath more or less pubescent; flowers about 8 lin. in diameter, white, with golden anthers, almost sessile and solitary in the axils of the leaves; bracts small, like the sepals and petals silky pubescent outside; ovary silky pubescent; drupes obovoid to oblong, waxy yellow, about an in. long, with 5 apical protuberances bearing the stigmas.

Hab.—Frequent in the drier hill-forests of Martaban, at 3,000 to 5,000 ft. elevation, rarely descending lower down.—Fl. March-Apr.; Fr. Apr.-May.—s.—SS.=Metam.

3. **P. serrata,** Bl. (*P. attenuata,* Seem.; H.f. Ind. Fl. i. 290.)—A rather small evergreen tree, the young shoots thinly silk-hairy; leaves obovate-oblong or obovate lanceolate, 6-7 in. long, cuneate or tapering at the base, on a rather thick glabrous petiole 6-8 lin. long, shortly acuminate, irregularly serrate, entire towards the base, membranous, glabrous, liver-coloured when dried; flowers middling-sized, on very short, thick, recurved, axillary pedicels; bracts very small, shortly and thinly puberulous; sepals and petals silky-puberulous outside; ovary densely silky-villous; styles 3, thick, free at summit; drupes globular or elliptic, the size of a small wood-apple, sprinkled with stiff short hairs, soon glabrous.

Hab.—Tenasserim.

SCHIMA, Rwdt.

Sepals 5, somewhat unequal. Petals 5, much imbricate. Stamens numerous ,adnate to the petal-base; anthers versatile. Ovary 5- rarely 4-6-celled, with 2 to 6 almost pendulous ovules in each cell; style simple with short stigmatic lobes. Capsule woody, usually spheroid, opening loculicidally in 4-6 valves, leaving a free central axis. Seeds flat, expanded along the outer edge into a narrow wing. Albumen thin. Radicle inferior.—Trees, with entire or crenate leaves and showy white flowers.

× *Peduncles very short and stout, usually not longer than the petiole.*

Peduncles short and straight, usually lenticellate, rather strong, the nerves beneath prominent, the net-veination distinct; leaves glabrous or slightly pubescent . . . . . *S. Wallichii.*

Peduncles 1 in. long, lenticellate; leaves pubescent beneath, the nerves and net-veination prominent and distinct . . . *Sch. mollis.*

Peduncles thick, lenticellate; leaves very coriaceous, glossy above, crenate, on both sides green, the net-veination indistinct, immersed . . . . . *Sch. monticola.*

Peduncles short and straight, smooth; flowers larger than in *Sch. crenata;* leaves glaucescent beneath, often entire; the lateral nerves prominent, the net-veination obsolete . . . . *Sch. Noronhæ.*

× × *Peduncles elongate, and often slender, always much longer than the petiole, smooth.*

Peduncles slender, usually more or less curved; leaves glaucous beneath, usually crenate-serrate, the nerves and net-veination beneath distinct . . . . . *S. crenata.*

Peduncles strong, but still slender, 1-1½ in. long; leaves very coriaceous, on both sides impressed net-veined, and almost wrinkled, entire or crenate, the lateral nerves entirely or nearly impressed . . . . . *Sch. Bancana.*

1. **Sch. Wallichii,** Chois.—A large tree, the young shoots silky pubescent, the branchlets lenticellate; leaves oblong-lanceolate to lanceolate, obtuse or acute at base, shortly but sharply acuminate, 4-5 in. long, on an ½-1 in. long petiole, usually slightly silky pubescent and pale-coloured beneath, the nerves and net-veination distinct; flowers about 1-1½ in. in diameter, white and fragrant, on ½-1 in. long lenticellate pedicels, arising singly from the axils of the leaves; sepals rounded, nearly twice broader than long, densely silky inside; capsules globose, woody, the size of a bullet, while young silky.

Hab.—Ava, Khakyen hills; Chittagong.—Fl. March.

Remarks.—Wood compact, brown.

2. **Sch. mollis,** Dyer; H. f. Ind. Fl. i. 288.—A tree, the young shoots silky pubescent, the branchlets lenticellate; leaves oblong-lanceolate to lanceolate, acute at base, on a puberulous petiole ⅓-½ in. long acute or acuminate, 5-7 in. long, coriaceous, beneath.

especially along the nerves, pubescent, and hardly pale-coloured, the net-veination indistinct; flowers unknown; capsules while young depressed-globose, silky, on a lenticellate, thick, axillary peduncle ¾-1 in. long.

HAB.—Ava hills.

3. **Sch. monticola,** Kz.—An evergreen tree (15—25+3—8+2—3), much branched, the leaf buds silky pubescent, the branchlets sparingly lenticellate; leaves oblong or elliptically oblong, obtuse or rounded at base, 3-4 in. long, on a broad petiole ½-¾ in. long, acute or almost blunt, coarsely crenate-serrate, very coriaceous, glossy above, glabrous, the net-veination indistinct, impressed; capsules depressed-globular, the size of a bullet, on a thick, lenticellate, 1½ in. long pedicel.

HAB.—On the highest crests of the Nattoung hills of Martaban, in the stunted hill-forests, at 6,000 to 7,200 ft. elevation.—Fr. March.—l.—SS.= Metam.

4. **Sch. Noronhæ,** Rwdt.—*Pan-ma.*—An evergreen tree (60—70+30—50+6—8), the young shoots silky pubescent, the branchlets lenticellate; bark about an in. thick, brown, brittle, irregularly and mostly longitudinally cracked; cut brown, dry; leaves oblong or oblong-lanceolate, acute at base, 5-6 in. long, on a puberulous glabrescent petiole ½-1 in. long, shortly acuminate or bluntish, coriaceous, entire, while young slightly appressed pubescent and glaucescent beneath; flowers about 1-1½ in. in diameter, white and fragrant, on ½-1 in. long, straight, lenticellate peduncle arising from the axils of the leaves, or the flowers more usually almost racemose caused by the fall of the leaves; sepals broadly rounded and several times broader than long, ciliate; capsules globular, mucronate, the size of a bullet.

HAB.—Frequent in the drier hill-forests of the Martaban hills, at 2,000 to 4,000 ft. elevation, entering also the hill Eng forests; Tenasserim.—Fl. Febr.-March; Fr. March-Apr.—l.—SS.=*Metam.*, Lat.

REMARKS.—Wood light-brown.

5. **Sch. crenata,** Korth.; H. f. Ind. Fl. i. 289.—An evergreen tree (60—70+3—8+2—3), the young shoots silky pubescent; leaves oblong-lanceolate to broadly lanceolate, obtuse or acute at base, somewhat decurrent on the 3 to 6 lin. long, puberulous petiole, acuminate, 2-4 in. long, usually crenate-serrate, beneath more or less glaucous and often puberulous along the midrib; flowers 1 in. in diameter, white and scented, on a slender, 1-1½ in. long, smooth, peduncle thickened upwards and arising singly from the axils of the leaves or more usually the flowers forming a short raceme at the end of the branchlets; sepals broadly rotundate, about twice so broad as

long, ciliate; capsules globular, the size of a small cherry, silky pubescent.

Hab.—Pegu, Rangoon District; Tenasserim.

6. **Sch. Bancana,** Miq.—A tree, the young shoots silky pubescent and the branchlets lenticellate; leaves elliptically to oblong-lanceolate, acute at base, and slightly decurrent on the ½-1 in. long, broad, glabrous petiole, long acuminate, coarsely crenate-serrate, very coriaceous, opaque, 3-4 in. long, the nerves and net-veination impressed beneath; flowers nearly 1½ in. in diameter, white, on a 1½-2 in. long, smooth peduncle, arising singly from the axils of the leaves or almost racemose; sepals rotundate, nearly as long as broad, glabrous or ciliolate; capsules globose, the size of a small cherry, appressed silky while young.

Hab.—Common in the Eng forests of the lower hills of Tenasserim and Martaban, up to 3,000 ft. elevation.

CAMELLIA, L.

Sepals 5 or 6, unequal, gradually passing into the bracts and petals. Petals much imbricate. Stamens numerous, the outer ones more or less monadelphous and adhering to the base of the petals, the 5-12 inner ones free; anthers versatile. Ovary 3- to 5-celled, with 4-5 suspended ovules in each cell; styles more or less united. Capsules woody, often short, and somewhat pointed, dehiscing loculicidally. Seeds usually solitary in each cell, not winged. Albumen none. Radicle superior.—Evergreen trees or shrubs, with serrate leaves. Flowers solitary or several in the axils of the leaves, often showy.

* *Stamens of inner series equal in number to the petals and free.*

All parts quite glabrous; flowers large; leaves coriaceous . . *C. Japonica.*

* * *Stamens of inner series twice as many as petals and free.*

Young parts and midrib of the membranous leaves pilose; flowers nodding, on a scaly peduncle a line long; filaments villous . *C. caudata.*

All parts glabrous; leaves coriaceous; pedicels not scaly; filaments glabrous . . . . . *C. Thea.*

Glabrous; leaves coriaceous; flowers almost sessile, erect; filaments glabrous . . . . . *C. drupifera.*

1. **C. caudata,** Wall.—An evergreen tree (12—15+5—6+1—2), with a spreading crown, the younger parts pilose from white soft hairs; leaves oblong to oblong-lanceolate, serrate, 2-3 in. long, rounded or obtuse at base, on a 2-3 lin. long, pilose petiole, shortly acuminate, membranous, with the exception of the midrib glabrous above, beneath sparingly pilose along the midrib; flowers solitary in the axils of the leaves, white, about an in. in diameter, drooping

on a hardly a lin. long scaly peduncle; ovary densely white-villous, the style glabrous.

Hab.—Not unfrequent in the drier hill-forests of the Martaban hills east of Tounghoo, at 3,000 to 4,000 ft. elevation.—Fl. March.—s.—SS. = Metam.

Remarks.—Wood soft, white.

2. **C. Thea,** Lk.; Brand. For. Fl. 25.; (*C. theifera,* Griff.; H.f. Ind. Fl. i. 292).—A small evergreen tree, usually kept down in cultivation as a shrub, all parts glabrous (or in the wild Assam variety [?] the young parts silky puberulous); leaves from lanceolate and obovate-lanceolate to ovate-oblong, shortly petioled, serrate, 3-4 in. long, usually acuminate, more or less coriaceous and glabrous; flowers white, solitary in the axils of the leaves, on a short 2-3-bracted nodding peduncle; sepals orbicular and very blunt, glabrous (or silky); petals 5, obovate, blunt, on the back glabrous or puberulous; stamens and style glabrous; ovary villous; capsule glabrous.

Hab.—Cultivated in the Chittagong and Arracan hills.

3. **C. drupifera,** Lour.; H.f. Ind. Fl. i. 293.—An evergreen shrub or small tree, the young shoots sparingly pubescent; leaves elliptical or elliptically oblong, acuminate at base, 3-4 in. long, on a 2-3 lin. long petiole, acuminate, coriaceous, especially towards the apex serrulate; flowers white, about 1½ in. in diameter, solitary, axillary, almost sessile; sepals orbicular, silky outside; petals obovate, notched; stamens glabrous; ovary villous; styles nearly free, woolly at base; capsule nearly an in. thick, depressed, 3-1 lobed, globose, smooth.

Hab.—Tenasserim.

DIPTEROCARPEÆ.

Flowers hermaphrodite, regular. Calyx-tube free from the ovary or adnate, bell-shaped and enlarging, or small and unchanged, the limb 5-parted or cleft, imbricate or rarely almost valvate, all or few of the lobes enlarging and wing-like, rarely unaltered under the fruit. Petals 5, twisted-imbricate, free or connate at base. Stamens numerous, or rarely definite, hypogynous or perigynous; anthers 2-celled, the connective often bristly produced or blunt. Ovary superior, or rarely half or wholly inferior, 3- rarely 2- or 1-celled, with usually paired anatropous ovules in each cell. Fruit usually a 1- or rarely 2-seeded nut enclosed or supported by the enlarged or unchanged calyx, or rarely inferior, the calyx-wings often all or few of them wing-like enlarged. Albumen none, or rarely fleshy and ruminate. Cotyledons fleshy, straight or crumpled.—Trees or shrubs, very rarely scandent, with alternate simple

leaves. Stipules large or small, persistent or deciduous. Flowers usually in racemes or panicles. Bracts minute or none, rarely larger and persistent.

An order of importance to the forester, containing the loftiest trees of the country. All the species abound in balsamic resins in various forms, camphor as well as wood-oil. The timber of all is more or less valuable.

* *Ovary* 1-*celled, with a single erect ovule; fruit adnate to the calyx-tube. Scandent shrubs* . . . . . *Ancistrocladus.*

* * *Ovary* 3- *rarely* 2-*celled, with* 2 *pendulous ovules in each cell.—Trees, rarely erect shrubs.*

○ Ovary inferior or nearly so, or with a broad base adnate to the calyx-tube; nuts for ½ to ¾ of their length adnate to the enlarged calyx-tube . . . . . *Anisoptera.*

○ ○ Ovary free, quite superior. Nuts free and enclosed in the calyx-tube, or exposed.

× Calyx-tube in fruit very enlarged, completely enclosing the nut . . . . . *Dipterocarpus.*

× × Calyx-tube in fruit not or hardly enlarged, the nuts quite exposed or surrounded by the calyx-wings.

+ Calyx-lobes valvate in bud . . . . . *Parashorea.*

+ + Calyx-lobes imbricate, and often also twisted in bud.

† The 3 outer calyx-lobes in fruit larger than the 2 inner ones.

Corolla-lobes spreading; anther-cells blunt, the connective bristled, or pointed-penicillate . . . . . *Shorea.*

Corolla-lobes closing into a hemispherical cup; anther-cells bristly 2-cleft, the connective subulate-pointed (thus anthers 5-setose) *Pentacme.*

† † The 2 outer calyx-lobes in fruit much longer than the 3 inner very small ones . . *Hopea.*

† † † All the 5 calyx-lobes in fruit equally enlarged, but not longer than the fruit itself . . . . . *Vatica.*

ANCISTROCLADUS, Wall.

Calyx-tube very short and adnate to the torus or to the base of the ovary, the sepals imbricate, more or less enlarging. Petals 5. Stamens 5 or 10, the connective blunt or apiculate. Ovary 1-celled, with a single erect ovule; style thick and fleshy; stigmas 3. Nut adnate to the terete or 5-cornered calyx-tube, and all the 5 calyx-segments equally enlarged, or 3 of them longer.—Large woody climbers, with entire, much net-veined leaves. Stipules small, deciduous. Flowers in panicles or from hooked tendrils.

All the 5 lobes of the fruiting calyx equally enlarged, stellately-spreading, short . . . . . *A. Griffithii.*

Wings of fruiting calyx unequal, the longer ones 1-1½ in. long . *A. Wallichii.*

1. **A. Griffithii,** Planch.; H.f. Ind. Fl. i. 300.—*Pan-ben-nway.*—A scandent, evergreen shrub, often remaining low and almost erect, all parts glabrous; leaves oblanceolate to elongate-oblanceolate,

5-10 in. long and from 1 to 1½ in. broad, narrowed at base and decurrent on the petiole, acuminate, glabrous, chartaceous, the net-venation faint and hardly prominent; panicles glabrous, at the end of the branches, rather slender, composed of spreading and curved branched racemes; flowers pale lilac or rose-coloured; stamens 10; the 5 calyx-lobes in fruit equally long, about ½ in. long, coriaceous, oblong, blunt, the borders of the 3 outer ones decurrent along 3 of the 5 corners of the short hemispherical tube, and forming as many thick longitudinal wings.

Hab.—Common in the swamp-forests and along muddy river-banks of Pegu and Martaban down to Tenasserim. Fl. Apr.-May; Fr. May-June.—s : l.—SS.= All.

2. **A. Wallichii**, Planch.—A large evergreen woody climber with dark-brown twisted stems, sending out numerous branchlets bearing strong, black, hooked tendrils, all parts quite glabrous; leaves variable in size and shape, those of the younger branches and shoots 1½-2 ft. long, elongate-lanceolate, towards the base almost cuneate and decurrent, those of the older branches much smaller, usually only 6-8 in. long, obversely lanceolate to broadly and oblong-lanceolate, acute or blunt, cuneate at the broadly decurrent base, and appearing sessile, or sometimes the petiole somewhat more manifest, more or less coriaceous, glabrous, often whitish or silvery dotted beneath; flowers nearly sessile, rather small, purplish, in dichotomous, loose, spreading panicles shorter than the leaves, the branchings very strong and usually curved; bracts ovate, acute; the fruiting calyx-tube more or less 5-ribbed or almost terete, the 5 calyx-wings very unequal, the 3 longer ones 1-1½ in. long, chartaceous, and strongly nerved.

Hab.—Frequent in the tropical forests of the Pegu Yomah and Martaban down to Tenasserim and the Andamans; also Chittagong.—Fl. Febr.-March; Fr. Apr.-May.—s : l.—SS-=SiS. Metam. etc.

ANISOPTERA, Korth.

Calyx-tube short, adnate to the torus, the lobes unequal, or nearly equal and distinctly valvate in bud. Stamens 15-35, in 2 to 4 rows, the connective terminating in a bristle or short acute gland. Ovary adnate to the calyx, inferior or half-inferior, 3-celled; style ovoid or oblong and 3-lobed (resembling a superior ovary) or filiform with a capitate 3-lobed stigma; nut to nearly ⅓ of its length adnate to the calyx or entirely inferior, the calyx-lobes unequal, 2 of them enlarged in wings.—Large trees with single glossy leaves. Flowers in racemose panicles.

Stamens only 15-18, the connective terminated by an acute gland; style filiform; nuts only ⅓ adnate to the calyx . . . . *A. odorata.*

Stamens numerous, the connective produced into a bristle; style ovoid; nut inferior or nearly so . . . . . *A. glabra.*

1. **A. odorata,** Kz. (*Vatica grandiflora,* Dyer; H.f. Ind. Fl. i. 301).—A tree, 20-40 ft. high, shedding leaves in H.S., the young shoots and branchlets greyish-velvety and covered with a fugaceous rusty-coloured scurvy tomentum; leaves oblong or oblong-lanceolate, usually obtuse at base, 3-5 in. long, rather shortly petioled, bluntish or acute, coriaceous, glabrous, net-veined, the midrib prominent on both sides; flowers fragrant, rather large, white, on very short rusty-coloured tomentose pedicels, forming terminal and lateral rusty-coloured or greyish scurvy tomentose racemes collected into panicles; calyx rusty-scurvy-tomentose, the lobes nearly equal and blunt; petals 5-6 lin. long, velvety outside; nut ovoid, acute, shortly tomentose, for nearly ⅓ adnate to the glabrous calyx, the 3 smaller wings about ⅔ in. long, lanceolate, narrowed at base, acuminate, the 2 long wings 2-2½ in. long, oblong-linear, blunt or notched, and somewhat narrowed towards the base.

Hab.—Tenasserim, apparently not unfrequent.

2. **A. glabra,** Kz.—*Thing-kadoo.*—An evergreen tree (100—120 + 60—70 + 10—12), all parts glabrous; leaves elliptically oblong to oblong, rounded or rarely obtuse at base, on a slender petiole 1-1¼ in. long, shortly acuminate, coriaceous, glabrous, the net-veination prominent, the midrib impressed above; racemes in the axils of the leaves, in a fruiting state puberulous; flowers unknown; fruiting calyx-tube globular, the size of a cherry, smooth, the 3 shorter lobes linear, bluntish, about 1-1½ in. long, the 2 wing-like longer lobes 4-5 in. long, linear-lanceolate, blunt, gradually narrowed towards the base, strongly 3-ribbed and transversely nerved, glabrous except the slightly tomentose ribs beneath; nut tomentose stylose-acuminate, adnate to the calyx for more than ⅔ of its length.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and the Martaban hills, east of Tounghoo.—Fr. Apr.-May.—s : l. SS.=*Metam.*, SiS.

DIPTEROCARPUS, Gaertn. f.

Calyx 5-lobed, with a turbinate or urceolate free tube. Petals somewhat cohering at base, spreading. Stamens numerous, free or nearly so, the connective produced into a cuspidate or acuminate point. Ovary free, 3-celled, the style filiform. Nut woody, 1-rarely 2-seeded, free and enclosed in the enlarged calyx-tube, the calyx-lobes enlarged, 3 of them remaining short, the 2 others growing out into long wings.—Lofty trees, with a cylindric stem often unbranched to nearly ¾-⅘ of its length. Leaves entire or coarsely repand-crenate. Stipules often large, deciduous. Flowers racemose or paniculed, often showy.

* *Calyx-tube in fruit more or less globular ovoid to turbinate, without any ribs or longitudinal wings on its belly.*

○ Calyx-tube in fruit towards the top produced into 5 compressed knobs alternating with the calyx-lobes . *D. tuberculatus.*

○○ Calyx-tube in fruit perfectly terete.

× Leaves glabrous and glossy.

Stipules velvety; fruiting calyx smooth and more or less pruinous. *D. lævis.*

Stipules glabrous; fruiting calyx sprinkled with minute stellate hairs . . . . . *D. Hasseltii.*

×× Leaves beneath or on both surfaces variously hairy.

Leaves acuminate, beneath and the petioles pubescent . . . *D. turbinatus.*

All softer parts greyish pubescent, the leaves blunt . . . *D. obtusifolius.*

Leaves acuminate, often large; petioles, young branchlets, and stipules brushy-strigose . . . . . *D. pilosus.*

** *Calyx-tube in fruit longitudinally 5-ribbed or 5-winged.*

○ Wings of the fruiting calyx-tube about half as broad or broader than the belly.

Calyx greyish tomentose, when in fruit sparingly stellate-puberulous; petioles long; leaves greyish pubescent . . *D. alatus.*

Calyx pruinous, quite glabrous; petioles 2-2½ in. long . . . *D. Griffithii.*

○○ Wings of the fruiting calyx-tube narrow or reduced to ribs.

Leaves blunt. All softer parts greyish villous . . . . *D. incanus.*

Leaves acuminate, the fruiting calyx-tube narrowly 5-winged and sparingly hairy . . . . . *D. costatus.*

* *Calyx-tube in fruit more or less ovoid or turbinate, without any ribs or longitudinal wings on its belly.*

1. **D. tuberculatus,** Roxb.; H.f. Ind. Fl. i. 297.—*Eng.*—A tree (70—80 + 40—50 + 8—10), shedding leaves in HS., the branches short and thick, crooked and horizontally spreading, all parts glabrous, or the shoots pubescent; bark dark-grey or blackish, nearly ½ in. thick, longitudinally cracked and furrowed; cut dry, brown; stipules about 4 in. long, covered by a dense greyish tomentum intermixed with short hairs; leaves broadly ovate to cordate-ovate, on a glabrous or pubescent petiole 4½ to 5½ in. long, rounded or usually cordate at base, 1-1½ ft. long, blunt or nearly so, slightly repand, glossy above, glabrous, or beneath downy from short stellate hairs, the ribs and nerves very strong and prominent beneath; flowers large, rose-coloured or purplish, somewhat one-sided, forming a poor simple or slightly branched greyish-velvety or pruinous raceme in the axils of the new leaves at the ends of the branchlets; petals 1¼ in. long, tomentose outside; calyx more or less pruinous or greyish-velvety, the short semidecurrent wings running down from between each pair of the calyx-lobes; fruiting calyx-tube 1-1½ in. in diameter, obovate, while young velvety or pruinous, soon glabrous, at the upper end produced into 5 sharp knobs, the 2 wing-like calyx-lobes 5-6 in. long, oblong, blunt, 3-nerved and net-veined, the 3 short ones almost orbicular, folded backwards; nuts tomentose.

Hab.—Forms the principal constituent of the Eng and hill Eng forests all over Ava, Prome, Pegu, and Martaban down to Tenasserim ; also Chittagong.—Fl. Apr. ; Fr. May.—l.—SS. = *Lat.* Arg. CaS.

Remarks.—Wood brown, with darker coloured heart-wood, rather heavy, loose-grained, □′ = 55 pd.—Timber much esteemed and used for house-posts, canoes, planking, etc. Yields no wood-oil, but exudes a clear yellow resin.

2. **D. lævis,** Ham.—*Kanyeng-nee.*—A tree (100—150 + 70—120 + 15—25), shedding leaves at the begin of HS., the young branchlets and stipules appressed greyish-velvety ; bark grey, peeling off in rounded irregular pieces ; leaves from ovate to ovate-oblong, up to a foot long, rounded or obtuse at base, on a glabrous or velvety, glabrescent petiole 1-2 in. long, acuminate, slightly repand, thin coriaceous, glabrous, and shining on both sides, the nerves straight and prominent beneath, glabrous or greyish-velvety ; flowers white or rose-coloured, rather large, more or less one-sided, forming simple, short, pruinous racemes above the axils of the fallen leaves ; petals velvety outside ; calyx and the lobes pruinous ; fruiting calyx ovate to ovoid, constricted below the lobes, smooth and more or less pruinous, about ⅔ in. in diameter, the 2 wing-like lobes 6-7 in. long, somewhat pruinous, linear, blunt, 1-nerved with ramified lateral nerves, which are accompanied at the base by 2 similar shorter parallel lateral nerves so as to make the wings 3-nerved. the short calyx-lobes oblong, hardly ½ in. long ; nut tawny-velvety.

Hab.—Frequent in the tropical forests all over Burma from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. Apr. ; Fr. May.—s : l.—SS. = *Metam.* SiS.

Remarks.—Wood brown, much exposed to decay, and therefore little used besides for rafters and planks. Said to shrink very much, and to last not longer than for two years. Yields a superior quality of wood-oil in large quantity, and exudes a dirty brown resin.

3. **D. Hasseltii,** Bl.—In every respect as former, but all parts, also the stipules, quite glabrous ; flowering calyx-lobes sparingly beset with minute stellate hairs, turning glabrous ; the lobes of the fruiting calyx sprinkled with minute stellate hairs, 3-nerved or almost 5-nerved. Probably only a variety of the preceding.

Hab.—In the tropical forests of the Andamans ; also Tenasserim. Fr. Apr.-May.—s : l.—SS. = SiS. etc.

4. **D. turbinatus,** Gaertn. f.—A tree (150—200 + 9—120 + 15—20), shedding leaves in HS., the young shoots and stipules greyish or yellowish pubescent ; leaves more or less oblong to ovate-oblong, obtuse at base, on a 1½-2 in. long pubescent petiole, acuminate, 5-7 in. long, coriaceous, on both sides (and more especially along the repand borders) pubescent, or above glabrescent with the exception of the coarser nerves, the nerves strong and parallel ; flowers as in *D. lævis,* but the calyx velvety and the lobes greyish-

tomentose, forming simple, more or less tomentose short racemes above the axils of the fallen leaves; petals velvety outside; fruiting calyx-tube and wings sprinkled with minute stellate hairs, more or less glabrescent, the wings like those of *D. lævis*.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu and Arracan Yomah, and from Martaban down to Tenasserim; also Chittagong.—Fl. Apr.; Fr. May.—s : l.—SS. = *Metam.* SiS.

Remarks.—Wood heavy, rather close-grained, the sapwood pale-brown, narrow, the heart-wood darker brown, takes a fine polish. Used for house-building, canoes, house-posts, planking, etc. □′ = 55 pd.—Yields wood-oil.

5. **D. obtusifolius,** Teysm.; H.f. Ind. Fl. i. 295.—A tree (70—80 + 40—50 + 8—10), shedding leaves in HS., the young shoots densely hirsute from long, stiff, pale tawny hairs; bark ash-grey, about ¾ in. thick, brittle, longitudinally cracked and rough; cut dry, brown; stipules from 4-5 in. long, hirsute or pubescent; leaves ovate to ovate-oblong, rounded or obtuse at base, 8-10 in. long, on a very hirsute (or rarely velvety) petiole 1-1½ in. long, blunt, slightly repand, coriaceous, on both surfaces shortly tomentose or pubescent, somewhat glabrescent above, the nerves straight and parallel; flowers showy, rose-coloured, almost sessile, forming short very hirsute racemes in the axils of the leaves; petals velvety outside; calyx softly greyish-velvety and pubescent; fruiting calyx-tube globular, hairy, more or less glabrescent, about an inch or more in diameter, the 2 wing-like lobes 1-nerved, with the 2 lateral nerves not fully developed and ramified as in *D. lævis*, 4-5 in. long, sprinkled with minute stellate hairs, the 3 short lobes oblong, ciliate, folded backwards, and hardly ½ in. long; nut densely tawny pubescent.

Hab.—Common in the hill Eng forests of Martaban and in the Eng forests of the Prome District, up to 2,000 ft. elevation.—Fl. March-Apr.; Fr. Apr.-May.—l.—SS. = Lat. Aren.

Remarks.—Wood brown, of the quality of that of Eng.

6. **D. pilosus,** Roxb.; H.f., Ind. Fl. i. 296.—An evergreen tree 80—100 ft. high, the younger branchlets densely covered with brush-like fascicled, tawny, stiff hairs; stipules rose-coloured, up to ½ ft. long, brushy-hirsute; leaves of younger branchlets very large, 1-1½ ft. long and of a thinner texture, the older ones smaller, broadly oblong to ovate-oblong, obtuse or rounded at the somewhat narrowed base, on a 2 in. long, brushy-hirsute petiole, shortly acuminate, chartaceous, or almost coriaceous, above along the impressed nerves and beneath all over pubescent from short, tawny, stellate and simple hairs; flowers showy, rose-coloured, forming simple, short, axillary racemes covered with brush-like fascicled, stiff hairs; calyx tawny tomentose from stellate hairs; petals oblong, blunt, sprinkled outside with stellate hairs; fruiting calyx oval, about an in. in diameter,

terete, sprinkled with minute stellate hairs, the 2 wing-like lobes 7-8 in. long, strongly 3-nerved and transversely veined, sparingly stellate-hairy; nuts appressed tawny pubescent.

Hab.—In the damp hill- and tropical forests of the Martaban hills east of Tounghoo down to Tenasserim; also Arracan.

* * *Calyx-tube in fruit longitudinally 5-ribbed or 5-winged.*

7. **D. alatus,** Roxb.—*Kanyin-pyoo*:—A tree (150—180 + 90—100 + 15—16), shedding leaves at the begin of HS., the younger branchlets and stipules densely pubescent, or covered with a greyish or yellowish short tomentum; bark grey, rather smooth, peeling off in irregular rounded pieces; leaves ovate to ovate-oblong, 5-9 in. long, rounded or obtuse at base, on a $1\frac{1}{2}$-2 in. long greyish-velvety-tomentose petiole, shortly acuminate or bluntish, shortly and densely pubescent, more or less glabrescent above, the nerves parallel and straight; flowers rather large, white, almost sessile, forming rather short, simple or 2-3-cleft, greyish-tomentose racemes in the axils of the young leaves; calyx densely greyish-tomentose, marked by 5 narrow longitudinal wings; petals velvety outside; fruiting calyx reddish, about an in. long, as long as broad or somewhat broader, pruinous and sprinkled with stellate short hairs, the 2 wing-like lobes 5-6 in. long, 3-nerved, sparingly stellate-hairy; nuts appressed pubescent.

Hab.—Frequent in the tropical forests of Pegu and Martaban down to Tenasserim; also Arracan.—Fl. Apr.-May; Fr. May.—s: l.—SS. = SiS. Metam.

Remarks.—Wood heavy, fibrous, but rather close-grained; the sapwood coarser, greyish-brown, the heart-wood dark-brown, takes fine polish. $\square' = 38$ pd. Used for house-building, especially for posts; when exposed to wet it decays rapidly, and canoes of it last only three to four years.—Yields wood-oil in great quantity, and exudes a dirty-brown resin.

8. **D. Griffithii,** Miq.; H.f. Ind. Fl. i. 299.—A leaf-shedding tree (120—150 + 90—100 + 15—16), young branches minutely yellowish-velvety, the stipules densely tawny hirsute; leaves ovate, rounded at base, 4-6 in. long, on a 2-$2\frac{1}{2}$ in. long petiole, apiculate, coriaceous, glabrous; flowers large, greyish-velvety outside, almost sessile, one-sided, forming supra-axillary, almost glabrous, poor, simple or slightly branched racemes; calyx-tube in fruit 2 to nearly 3 in. long, longer than broad, almost 5-angular, the corners produced into as many broad wings, quite glabrous and pruinous, the wing-like calyx-lobes 4-5 in. long, oblong, blunt, 3- towards the base 5-nerved and net-veined, more or less pruinous, the smaller lobes almost orbicular, folded backwards; nuts densely tawny pubescent.

Hab.—Common in the tropical and moister upper mixed forests of the Andamans; Tenasserim.—Fr. May.—s: l.—SS. = SiS.

Remarks.—Wood yellowish-grey, rather coarsely fibrous, close-grained, rather heavy.

9. **D. costatus,** Gaertn.—A leaf-shedding tree (40—50 + 12—20 + 3—4), all the younger parts densely greyish-tomentose; stipules densely tawny or yellowish pubescent; leaves ovate to ovate-oblong, 6-7 in. long, cordate or rounded at base, on an in. long or somewhat longer greyish pubescent petiole, shortly acuminate or acute, coriaceous, tomentose from short stellate hairs, more or less glabrescent above, the nerves straight and parallel; flowers forming short axillary racemes covered with a dense yellowish or greyish tomentum intermixed with soft hairs; fruiting calyx-tube about ½ in. in diameter, 5-angular, the corners produced into as many narrow wings, slightly tomentose and hairy, the 2 wing-like calyx-lobes about 4 in. long, obovate-oblong, blunt, sprinkled with minute stellate hairs, 1-nerved with 2-4 shorter parallel ramified nerves, and net-veined; nut appressed pubescent.

Hab.—Frequent in the hill Eng-forests of the Martaban hills and in Upper Tenasserim, up to 2,000 ft. elevation; also Chittagong.—Fr. Apr.-May.—l.—SS. = *Lat.* Metam.

N. B.—There grow on the Andamans 2 or 3 other species of *Dipterocarpus* of which only the leaves are known.

PARASHOREA, Kz.

Calyx-tube very short, not enlarging. Stamens 12-15, the connective mucronulate. Ovary free, 3-celled; style filiform. Calyx-tube in fruit not enlarged, the 5-lobes valvate and almost equally wing-like enlarged in fruit. Nut one-seeded, free, and not in the least enclosed by the spreading calyx-lobes.—Lofty trees, with shining leaves. Flowers small, whitish, racemose in dense panicles.

1. **P. stellata,** Kz. (*Shorea stellata,* Dyer; H.f. Ind. Fl. i. 304).—*Koung-mhoo.*—An evergreen tree (120—150 + 80—90 + 9—15), all parts quite glabrous; bark ½ in. thick, dark-brown or blackish, longitudinally fissured and cracked, rough, peeling off in irregular rounded pieces; cut pale-brown; leaves from oblong and oblong-lanceolate to ovate-lanceolate, 5-6 in. long, acute or obtuse at the more or less unequal base, on a ½-1 in. long petiole, bluntish or bluntish acuminate, coriaceous, glabrous, somewhat shining, the lateral nerves slightly curved and prominent, the net-veination very faint; flowers small, cream-coloured, almost sessile, racemose, forming greyish puberulous rather short panicles in the axils of the leaves or almost terminal; calyx greyish-velvety, the lobes oblong, blunt; petals broadly oval, greyish-velvety outside; ovary ovate or oval, rather long-styled, greyish-tomentose; calyx-tube in fruit hardly enlarged, and therefore the ovate acuminate tawny velvety nut free and exposed, surrounded by the nearly equal 4-5 in. long spreading wing-like calyx-lobes; the latter linear or linear-lanceolate, blunt,

much narrowed and almost stalk-like at base, the 5 nerves parallel and transversely net-veined.

Hab.—Frequent in the tropical forests of Martaban; rather rare along the eastern slopes of the Pegu Yomah, up to 1,500 ft. elevation.—Fl. March; Fr. Apr.-May.—s : l.—SS. = *Metam.* SiS.

Remarks.—Sapwood light-brown.

SHOREA, Roxb.

Calyx-tube very short. Stamens 35-100, the cells unequal and often a little pilose at the tips, the connective terminating in a bristle or penicellate sharp point. Ovary free, 3-celled. Fruiting calyx not enlarged, the wing-like 5 lobes erect, very imbricate, and with their broad twisted bases closely embracing the nut, the 3 outer ones shorter.—Trees, with entire leaves. Flowers usually rather small, racemose in panicles.

* *Inflorescence tomentose or velvety-pubescent.*
× Leaves chartaceous, when full-grown glabrous or nearly so.
Shorter calyx-lobes in fruit acuminate; stamens c. 20-25 . . *S. obtusa.*
Shorter calyx-lobes in fruit blunt; stamens about 50 . . . *S. robusta.*
× × Leaves very coriaceous, appressed silvery beneath.
Incompletely known; leaves apparently not deciduous . . . *S. Helferi.*
* * *Inflorescence quite glabrous.* . . . . *S. floribunda.*

1. **S. obtusa,** Wall.; H.f. Ind. Fl. i. 306.—*Thit-ya.*—A tree (70—80 + 40—50 + 6—7), shedding leaves in HS., the young shoots covered by a fugaceous, greyish or whitish stellate tomentum; bark irregularly cracked and fissured, blackish-grey, rough and brittle; leaves elliptical to elliptically oblong, 4-6 (on very old trees 2-4) in. long, rounded at base, on a $\frac{2}{3}$ in. long, glabrous petiole, blunt or occasionally bluntish apiculate, thick chartaceous, entire, while young and herbaceous (especially beneath) sprinkled with tufts of stellate short hairs, usually soon glabrous, tufty-hairy in the nerve-axils beneath; flowers yellowish, rather small, almost sessile, in short racemes, forming whitish almost scurfy-tomentose panicles in the axils of the new or fallen leaves; calyx about a line long, white-tomentose; petals velvety outside, linear to linear-lanceolate, acuminate, 3-4 lin. long; lobes of the fruiting calyx enclosing a pubescent nut of the size of a cherry-stone, oblong-lanceolate, slightly puberulous, greyish-velvety towards the dilated broad bases, the 3 outer longer ones about 2 in. long, somewhat acute or bluntish, the 2 inner ones about $\frac{1}{2}$ to $\frac{1}{4}$ shorter, linear-lanceolate, acuminate.

Hab.—Common in the Eng and hill Eng-forests all over Burma from Ava, Prome, and Martaban down to Tenasserim, up to 2,000 ft. elevation.—Fl. March; Fr. Apr.-May.—l.—SS.=petrophilous imperm., *Lat.*

Remarks.—Wood rather light and coarse, loose-grained, brown, nebulous, □'=57 pd. Wood valued equal to that of Eng, excellent for tool-handles and planes, also for canoes, &c.—Exudes white resin.

N. B.—The Sâl-tree, *Shorea robusta*, Gaertn. (Bedd. Sylv. Madr. 26, t. 4.; Brand. For. Fl. 26, t. 9), is said to grow in Ava, but I have seen no specimens of it.

2. **S. Helferi,** Kz. (*Vatica Helferi*, Dyer; H.f. Ind. Fl. i. 302).—A tree; leaves oblong or elliptically oblong, 4-6 in. long, cordate at base, on a thick 3-4 lin. long petiole, coriaceous, blunt, glabrous above, beneath minutely silvery-puberulous, the lateral nerves numerous and prominent; flowers in bud whitish-tomentose, sessile, racemose, forming white or greyish-tomentose 2-5 in. long panicles in the axils of the leaves or almost terminal; rest unknown.

Hab.—Tenasserim.

S. nervosa, Kz., is another Tenasserim species, of which the flowers and fruits are still unknown. It differs from *Sh. leprosula* in having the upper side of the leaves not scabrous and generally in the indumentum and nervation. It yields a clear yellowish resin of the qualities and smell of colphony.

3. **Sh. floribunda,** Kz.; H.f. Ind. Fl. i. 304.—A leaf-shedding tree, all parts glabrous; young leaves oblong to elliptical, rounded at base, on a slender petiole $\frac{1}{2}$-$\frac{3}{4}$ in. long, acute, 3-4 in. long, glabrous; flowers middling-sized, almost sessile, racemose, forming quite glabrous, slender panicles in the axils of the young leaves; calyx quite glabrous, the 2 inner lobes a little shorter; petals nearly $\frac{1}{2}$ in. long, yellowish (?) lanceolate, slightly pubescent outside; stamens only about 15, the connective terminating into a reflexed bristle as long as the anther itself.

Hab.—Tenasserim.—Fl. Decb.

PENTACME, DC.

Calyx imbricate, the tube very short. Petals infracted from their middle, and closely twisted round the sexual organs so as to form a closed hemispherical corolla perforated only at the top. Stamens 15; anthers 4-celled, the cells almost equal, saccate at base, tapering into subulate points, the connective also terminated by a rigid bristle. Ovary free; style filiform. Nut enclosed in the broad imbricate bases of the 5 wing-like enlarged calyx-lobes, the 2 inner wings somewhat shorter.—Large trees with entire leaves. Flowers in lax panicles. Fruits of *Shorea*.

1. **P. Siamensis,** Kz. (*Shorea Siamensis*, Miq.; H.f. Ind. Fl. i. 304).—*Eng-kyn.*—A tree (60—90+40—50+5—6), leafless during HS., the leaf-buds and sometimes the young leaves beneath covered

with a fugaceous whitish or cream-coloured soft tomentum or pubescence; bark greyish-brown, rough and eroded, very thick, deeply cracked and brittle; leaves from oblong to ovate-oblong, on a 1½ to 2½ in. long, glabrous petiole thickened at the summit, more or less cordate or rounded at base, 7-10 in. long, bluntish or slightly apiculate, chartaceous, while very young whitish-tomentose beneath, soon quite glabrous, the nerves parallel and slightly curved, with prominent, but thin transverse veins; flowers showy, waxy-yellow, on 1-1½ lin. long, smooth pedicels, racemose, forming purplish-coloured or green, smooth or pruinose, lax panicles above the scars of the fallen leaves; fruiting calyx not enlarged, but the pedicels thickened and resembling a calyx-tube; nut quite glabrous, the size of a small cherry, ovoid, enclosed by the imbricate broad thickened bases of the wing-like calyx-lobes, the latter obovate-lanceolate, blunt, much narrowed towards the dilated base, the 2 inner ones somewhat shorter.

Hab.—Very frequent in the Eng and dry forests, more especially in those of Ava and the Prome district, less frequent from Pegu and Martaban down to Tenasserim.—Fl. March; Fr. Apr.-May.—l.—SS.=CaS. Lat.

Remarks.—Wood dark or reddish-brown, tough and hard, close-grained, very heavy, and said to be as durable as teak. □′=55 pd.—Used in house-building, for bows, etc.—Exudes a red resin.

HOPEA, Roxb.

Calyx-tube very short, the lobes imbricate. Stamens 15; anther-valves nearly equal, the connective terminating in a short point or produced into a long bristle. Ovary free, 3-celled. Calyx-tube in fruit not enlarged, 2 of the 5 lobes wing-like enlarged, the 3 outer ones remaining very short. Nut embraced by the calyx-lobes.—Trees, with entire leaves and racemose flowers forming axillary panicles.

* *Connective terminated by a short point.*

Calyx greyish-tomentose; leaves bluntish acuminate . . . *H. odorata.*
Leaves oblong, blunt . . . . . *H. scaphula.*

* * *Connective terminated by a bristle longer than the anther-cells.*

Calyx greyish-tomentose; flowers somewhat larger; leaves glossy above . . . . . *H. gratissima.*
Calyx glabrescent; leaves opaque on both sides . . . . *H. oblongifolia.*
Calyx almost glabrous; flowers very small; leaves glossy above . *H. Griffithii.*

1. **H. odorata,** Roxb.; H.f. Ind. Fl. i. 308.—*Thengan.*—An evergreen tree (100—120+40—70+10—12), the young shoots greyish puberulous; bark about ½ in. thick, blackish-brown, longitudinally and deeply furrowed, rough; leaves ovate-oblong to ovate- or oblong-lanceolate, on slender petioles, usually obtuse at the unequal base, bluntish or bluntish acuminate, coriaceous, somewhat puberous

when young, soon turning glabrous; flowers small, fragrant, white, on very short pedicels, one-sided-racemose, forming axillary or almost terminal greyish or whitish-tomentose panicles; calyx softly tomentose, the lobes blunt; petals 2-3 lin. long, oblong, falcate, puberulous; fruits small, the 2 wing-like calyx-lobes 1½ in. long, oblong, blunt, somewhat narrowed at the puberulous base, 9-10-nerved, the 3 smaller ones only of the length of the glabrous pointed nut.

Hab.—Common in the tropical forests all over Burma from Chittagong and Martaban down to Tenasserim.—Fl. March-Apr.; Fr. May-June.—s.—SS.= SiS. Metam.

Remarks.—Wood brown, heavy, and close-grained. W=□'=46, breaking weight=800 pd. Especially in use for canoes and boats; prized for cart-wheels. Boats constructed of Thingan are said to last for more than twenty years.—Yields a yellow resin.

2. **H. scaphula,** Roxb. (*Vatica scaphula,* Dyer; H.f. Ind. Fl. i. 301).—A large tree; leaves elliptically oblong, on rather slender petioles, blunt, or almost bluntish, glabrous; flowers white, rather showy, racemose, forming puberulous, axillary, and terminal panicles; petals oblong, falcate, crenulate, about 3 lin. long; stamens 15, 5 of them free, the remaining 10 by pairs connate at base and alternating with the free ones; connective mucronate; style simple, shortly 3-lobed.

Hab.—Chittagong.—Fl. Jan.

Remarks.—The trunk used for making canoes.

3. **H. gratissima,** Wall. (*Shorea gratissima,* Dyer; H.f. Ind. Fl. i. 307).—A glabrous tree; leaves broadly lanceolate, slenderly petioled, acute at base, shortly and bluntish acuminate, coriaceous, glossy above, the 15-16 nerves almost parallel, the midrib sharply prominent beneath; flowers small, on very short pedicels, in one-sided racemes, forming axillary and terminal slightly puberulous panicles; calyx velvety, the lobes lanceolate, bluntish; petals 2 lin. long, velvety outside; the connective terminated by a very long flexuose bristle.

Hab.—Tenasserim.

4. **H. oblongifolia,** Dyer, in H.f. Ind. Fl. i. 309.—A tree, all parts glabrous; leaves oblong, on an ½ in. long petiole, obtuse at the base, about 7 in. long, shortly acuminate, firm, glabrous and rather opaque, the lateral nerves (about 10 pairs) scarcely curved; flowers on very short pedicels, racemose, forming solitary or paired panicles in the axils of the leaves and shorter than them; calyx-lobes ovate, acute, glabrescent; petals pubescent; anthers orbicular, with an appendage 4 times their length. (After Hooker's Fl. Ind.)

Hab.—Southern Tenasserim.

5. **H. Griffithii,** Kz.; H.f. Ind. Fl. i. 310.—A glabrous tree; leaves ovate, lanceolate, on a rather short but slender petiole, acute at base, long and bluntish caudate-acuminate, coriaceous, somewhat glossy, and the midrib sharply prominent beneath, the 10-12 lateral nerves very faint and sometimes hardly visible; flowers very small, almost sessile, in one-sided racemes, forming rather simple flexuose and slender glabrous panicles in the axils of the leaves; calyx glabrous, the lobes broad, rounded and ciliate; petals velvety outside, about a line long; anthers short, terminated by a dark-coloured stiff bristle of the length of the anther itself or somewhat longer.

Hab.—Tenasserim.

VATICA, L.

Calyx-tube very short, adnate to the torus; the lobes manifestly imbricate. Stamens 15, the connective produced in a sharp point shorter than the unequal anther-cells. Ovary inserted with a broad base, free, 3-celled; style linear. Capsules free, coriaceous, irregularly dehiscent or dehiscing from the apex by 3 valves, one-seeded; the calyx-tube unchanged, the lobes only slightly enlarged, equally long, and never reaching the length of the capsule itself.—Glabrous trees with entire leaves. Flowers fragrant, racemose in panicles.

1. **V. lanceæfolia,** Bl.; H.f. Ind. Fl. i. 302.—A middle-sized tree, the younger parts mealy-puberulous, soon glabrescent; leaves lanceolate, acute at base, 5-8 in. long, acuminate, glabrous, more or less glaucous beneath, chartaceous; flowers rather large, white, shortly pedicelled, in racemes, forming axillary and terminal tawny puberulous panicles; calyx (and petals outside) tawny velvety, the lobes ovate, acute; capsule the size of a pigeon's egg, supported by the 5 nearly equally enlarged calyx-lobes shorter than the calyx itself.

Hab.—Chittagong; Burma.—Fl. May; Fr. Jul.-Aug.

Remarks.—Ghund of the Brahmins, a strong-smelling balsam, is the product of this tree.

MALVACEÆ.

Flowers regular, hermaphrodite or unisexual. Bracteoles 3 or more, free or combined, often forming a sort of calyx. Sepals 5, valvate, free or connate. Petals 5, twisted-imbricate. Stamens numerous, rarely definite, adnate to the base of the petals; filaments united in a tube or a column; anthers oblong or reniform, ultimately 1-celled, the cells sinuous or twisted, bursting longitudinally. Ovary 2-many-celled, with 1 or more ovules in each cell attached to the inner angle, entire or lobed, or of 2-5 or more carpels

whorled round a central axis; styles more or less or entirely connate; stigmas various. Fruit of dry indehiscent or dehiscent cocci, or capsular and loculicidally dehiscing. Albumen scanty or none. Embryo curved, the cotyledons leafy, usually folded or crumpled.—Herbs or shrubs, rarely trees, with alternate, palmati-nerved, simple or rarely compound leaves. Stipules free, sometimes caducous. Flowers axillary or terminal, variously arranged.

All the members of this order abound more or less in mucilage, and many, like the mallows, are used as demulcents and emollients. The liber of most species is very tenaceous, and furnishes cordage and strong fibre, and *Hibiscus cannabinus* yields strong hemp. A sort of cotton is the product of *Bombax* and *Eriodendron*, and the true cotton (*Gossypium*) belongs also to this family. The fruit of the Durian (*Durio*) is considered one of the most delicious tropical fruits in spite of its disagreeable smell. The Boabab (*Adansonia*), one of the biggest trees of the world, yields also strong fibre. Burma nourishes 55 species of this order, of which only few are trees with soft and usually useless wood, but usually strong fibre.

* *Carpels not united, but more or less free and whorled round an axis in a single row.*

Bracteoles none. Carpels broadly stellate, not beaked . . . *Anoda.*

** *Carpels united into a dehiscent or rarely indehiscent capsule.*

○ Staminal column truncate, or 5-toothed at summit, bearing the anthers or filaments outside, or also on the summit itself.

× Style branched at top. Seeds usually reniform.

Bracteoles enlarging under the fruit. Capsule 2-3-valved . . *Kydia.*

Bracteoles not enlarging or wanting. Capsule 5-celled . . . *Hibiscus.*

×× Stigmas clavate, undivided, or shortly erect-branched. Seeds obovoid or angular.

Bracteoles 3 to 5, usually small . . . . . *Thespesia.*

Bracteoles 3, large and leafy, cordate . . . . . *Gossypium.*

○○ Staminal column divided at summit, or rarely to the base, into numerous filaments, or 5 to 8 staminal bundles.

× Leaves digitate.

Ultimate filaments with a single anther. . . . . *Bombax.*

Ultimate filaments with 2 or 3 anthers . . . . . *Eriodendron.*

×× Leaves simple. Fruits large, muricate . . *Durio.*

KYDIA, Roxb.

Flowers polygamous. Bracteoles 3-4, leafy, connate at base, enlarging and spreading under the fruit. Sepals 5, connate below the middle. Petals as many, adnate to the staminal tube. Staminal tube divided about the middle into 5 divisions, each bearing 3 reniform anthers, the latter imperfect in the female flowers. Ovary 2-3-celled, with 2 ascending ovules in each cell; style 3-cleft with as many peltate stigmas, imperfect in male flowers. Capsule almost

globose, loculicidally 3-valved. Seeds reniform, stellately pubescent.—Trees with palmatinerved leaves. Flowers panicled.

1. **K. calycina,** Roxb.; H.f. Ind. Fl. i. 348; Bedd. Sylv. Madr. 28, t. 3, f. 5; Brand. For. Fl. 29.—*Dwa-bote.*—A tree (25—40 + 8—20 + 3—4), sometimes remaining shrubby, shedding leaves in HS., all parts more or less stellate-tomentose or velvety; bark thin, dark-grey, wrinkled, with annular swellings; leaves cordate or ovate, about 4-5 in. long and broad, on a 1-2 in. long stellate-pubescent petiole, 5-7-nerved at the cordate base, blunt or acuminate, bluntish-lobed, chartaceous, scabrously stellate-pubescent above, beneath stellate-velvety or floccose stellate-pubescent, the midrib with a gland at the middle; flowers rather small, white, in lateral and terminal stellate-tomentose panicles; involucel usually 4-leaved, stellate-pubescent; capsule enclosed by the persistent bell-shaped calyx and supported by the spreading blunt accrescent involucel-leaflets.

Hab.—Not unfrequent in the mixed and open forests of Pegu and Prome also Ava.—Fl. Jan.; Fr. H.S.—s×l.—SS. = *CaS.* SiS. Metam.

Remarks.—Wood white, straight-grained, good for house-building. The liber yields fibre.

HIBISCUS, L.

Flowers hermaphrodite. Bracteoles free, or more or less connate, several, rarely reduced to 5 or fewer. Calyx 5-lobed or toothed, or spathaceous. Petals 5, connate at base with the staminal tube. Staminal tube truncate or 5-toothed at the summit; filaments many; anthers 1-celled. Ovary 5-celled, with 3 or more ovules in each cell; styles 5, connate at base. Capsule loculicidally 5- or rarely spuriously 10-celled, velvety, dehiscing.—Herbs, shrubs, or trees, with more or less palmately lobed or entire leaves. Flowers often showy, in axillary inflorescences.

* *Calyx regular, not spathaceous, more or less persistent. Leaflets of involucre free or nearly so.*

× Capsules rounded at top.

All parts, also calyx and involucre, densely scurfy-tomentose; involucre-leaflets 10 . . . . . *H. mutabilis.*

As preceding, but all parts softly tomentose; involucre and calyx densely pubescent; involucre-leaflets 7 (or 5) . . . . *H. venustus.*

× × Capsules acuminate or acute. Glabrous or nearly so.

Pedicels shorter than the petioles . . . . . *H. Syriacus.*

Pedicels elongate, longer than the petioles . . . . . *H. Rosa Sinensis.*

* * *Involucre-leaflets united up to the middle or at least at base, sometimes forming a cup.*

○ Erect trees or shrubs. Seeds glabrous.

Leaves deeply 3-lobed . . . . . *H. hastatus.*

Leaves not divided, entire or crenulate . . . . . *H. tiliaceus.*

○ ○ Seeds woolly or pubescent.

Woody climber, velvety tomentose . . . . . *H. scandens.*
Erect tree, all softer parts tawny setose . . . . . *H. macrophyllus.*

* *Leaflets of involucre free.*

1. **H. mutabilis,** L. ; H.f. Ind. Fl. i. 344.—A large shrub or little tree of few years' duration, the softer parts all scurfy tomentose ; leaves broadly cordate, about 4 to 5 in. long, on a 3-4 in. long tomentose petiole, covered with a thin scurfy tomentum, 5-7-lobed, the lobes broad, acute or cuspidate, irregularly repand-toothed ; flowers large, white, soon turning deep rose-coloured, on scurfy tomentose straight peduncles nearly as long as the petiole, axillary, solitary, sometimes collected into a spurious leafy terminal raceme ; involucre consisting of 8 to 10 linear somewhat stiff leaflets half as long as the ovate acuminate 3-nerved and tomentose calyx-lobes ; capsules depressed-orbicular, hairy outside and within ; seeds woolly.

Hab.—Here and there cultivated in gardens.

2. **H. venustus,** Bl. var. **Brandisii.**—A shrub of few years' duration, all softer parts densely and softly tomentose ; leaves cordate or cordate-oblong, shortly 5-lobed, with the lobes acute or undivided, about 5-6 in. long and broad, on a densely pilose, straight petiole 3 to 4 in. long, coarsely and irregularly repand-toothed, membranous, on both sides softly pubescent ; stipules linear ; flowers about 3-4 in. in diameter, solitary, or by 2-3 on a 3-4 in. long densely pilose straight peduncle jointed at the middle, axillary, or forming a terminal lax panicle ; involucre much shorter than the $\frac{2}{3}$ in. long 5-cleft densely pubescent calyx, consisting of usually 7 linear pilose leaflets reflexed already while in bud ; calyx-lobes broadly lanceolate, acuminate, 1-nerved, longer than the densely tawny-setose, globular, obtuse capsule ; seeds brushy-hispid from short, stiff, red-brown hairs.

Hab.—Upper Tenasserim.—Fl. Fr. March.

3. **H. Syriacus,** L. ; H.f. Ind. Fl. i. 344.—A glabrous or slightly puberulous evergreen shrub ; leaves ovate or rhomboid-ovate, on a more or less puberulous petiole 6-8 lin. long, usually cuneate at base, $\frac{1}{2}$-2 in. long, entire or often more or less 3-lobed, with the lobes acute or rather blunt, repand-toothed, while young slightly pubescent ; flowers pale purple or white, axillary, solitary, on pedicels shorter than the petioles ; involucre consisting of 6-7 linear one-nerved leaflets a little shorter than the oblong, acute, scurfy-tomentose calyx-lobes ; seeds with a line of elastic hairs.

Hab. —Occasionally cultivated by the Karens in the Martaban hills.

4. **H. Rosa Sinensis,** L. ; H.f. Ind. Fl. i. 344.—*Khoung-yan.*—A little evergreen tree, but usually remaining a shrub, the younger

parts slightly greyish pubescent; leaves ovate, on a short canescent petiole, rounded or obtuse at base, acute or acuminate, coarsely toothed, glabrous, or beneath along the nerves slightly appressed puberulous; flowers large, purple, rose-coloured or white, rarely watery-yellow, solitary, axillary, on a slender elongate pedicel as long or longer than the leaves; involucre consisting of 6-7 linear leaflets about half so long as the oblong acuminate puberulous calyx-lobes; capsules nearly globose.

Hab.—Much cultivated in native gardens and villages, and occasionally seen wild in neglected lands round villages.—Fl. ∞.—s.

* * *Involucre-leaflets united up to the middle or at least at the base, sometimes forming a cup.*

5. **H. hastatus,** L. f. (*H. tricuspis,* Cav.; H.f. Ind. Fl. i. 344).—A small evergreen tree or shrub, the younger parts slightly pubescent or tomentose; leaves about ½ ft. long, long-petioled, 3-5-lobed, with the lobes elongate and bluntish acuminate (the middle one usually much longer), slightly toothed or entire, above along the nerves and beneath wholly pubescent; flowers large, sulfur with a dark-purple eye, axillary, solitary, or more usually by 2-3 in a long-peduncled axillary raceme; involucre bell-shaped, tomentose, divided into 9-10 rigid linear-lanceolate lobes about ½ so long as the lanceolate densely tomentose calyx-lobes; capsules oblong, depressed and acute at top, tomentose; seeds reniform, minutely granulate, glabrous.

Hab.—Rarely cultivated in gardens.—Fl. R. S.

6. **H. tiliaceus,** L.; H.f. Ind. Fl. i. 343; Bedd. Sylv. Madr. 29, t. 4, f. 1.—*Theng-pen or thimban.*—An evergreen tree (25—30 +6—10+2—3), usually crooked and stunted or shrub-like, the younger parts shortly and densely tomentose; stipules broadly oblong, large, deciduous; leaves cordate-ovate or broadly cordate, 4-6 in. long, long-petioled, shortly and abruptly acuminate, entire or crenulate, above roughish from minute stellate hairs, soon glabrescent, beneath shortly and densely tomentose; flowers large, yellow with a dark crimson eye, on short axillary pedicels, or by 2-3 in an axillary elongate leafless raceme; involucre bell-shaped, tomentose, 10-toothed, or divided to about the middle into as many lanceolate rigid lobes of about half the length of the tomentose acuminate calyx-lobes or shorter; capsule shorter than the calyx, oblong, acuminate, densely hairy; seeds glabrous.

Hab.—Common in the beach and tidal forests all along the shores from Chittagong down to Tenasserim and the Andamans, ascending the rivers as far as the tidal waves.—Fl. Fr. ∞—l.—SS. = Ca. Sal.

Remarks.—Liber a strong fibre for cordage. Wood soft and valueless.

7. **H. macrophyllus,** Roxb.; H. f. Ind. Fl. i. 337.—*Vetroon.*—An evergreen tree (30—50 + 15—30 + 3—5), all softer parts

covered with a short, soft, tomentose tomentum intermixed with long, brushy, tawny, stiff hairs ; bark whitish, about 2 lin. thick, rather smooth, longitudinally marked with little corky lenticels ; cut pale coloured, dry ; stipules very large, densely tawny or rusty hirsute, deciduous ; leaves cordate or broadly rotundate-cordate, on a long tomentose and tawny setose petiole, about ½-1 ft. long and broad, shortly acuminate, entire, densely and softly tawny tomentose on both sides ; flowers large, yellow, with a dark-purple eye, soon turning reddish or purplish in falling off, on short tomentose and setose pedicels, forming poor racemes on rather long axillary peduncles ; involucre divided to near the base in about 10 stiff, erect, tawny hirsute lobes somewhat shorter than the lanceolate hirsute calyx-lobes ; capsules ovoid, a little shorter than the calyx, obtuse, with a mucro, densely tawny setose ; seeds lined with dense tawny long hairs.

Hab.—Frequent in the tropical forests all over Burma from Chittagong and Martaban down to Tenasserim.—Fl. Fr. R. S.—s.—SS.=Metam. SiS.

Remarks.—Wood rather heavy, fibrous, but close-grained, soft, white, turning pale brown at exposure. Liber a strong fibre for cordage. Might be used for house-posts and for other in-door house-building purposes.

8. **H. scandens,** Roxb. ; H.f. Ind. Fl. i. 337.—A lofty, woody, scandent shrub, the stems as thick as an arm, all softer parts velvety-tomentose ; bark rather thick, slightly rimose, smooth ; cut brown ; leaves cordate or broadly cordate, shortly and bluntish 3-5-lobed, on rather long shortly tomentose petioles, very variable in size, 2-4 in. long and broad, obsoletely toothed, sparingly velvety and soon more or less glabrescent above, beneath greyish-velvety-tomentose from stellate hairs ; flowers middling-sized, yellowish, with purple tips, yellowish purple outside, with or without a purple eye, on about 1-1½ in. long tawny tomentose peduncles jointed below the calyx and arranged in short axillary racemes, usually forming larger or smaller terminal panicles ; involucre almost coriaceous, greyish-velvety, deeply 4-7 (usually 6-) cleft, the lobes broadly lanceolate, acute, shorter than the oblong-lanceolate velvety 3-nerved calyx-lobes ; capsules ovate-oblong, longer than the calyx, rather obtuse, with a mucro, densely stellate-hispid ; seeds covered with long, soft, white cotton.

Hab.—Frequent in the tropical forests of Martaban.—Fl. Fr. March-Apr. —s : l.—SS.=Metam.

Remarks.—Wood light, coarsely fibrous, white, then yellowish, very perishable.

THESPESIA, Corr.

Bracteoles 5-8 or fewer, rarely wanting, deciduous. Calyx truncate, minutely 5-toothed, or parted. Corolla convolute. Stami-

nal tube 5-toothed at apex. Ovary 5-4-celled, with few ovules in each cell, the style furrowed, club-shaped, entire or 5-toothed. Capsule opening more or less freely loculicidally, almost woody.—Trees or shrubs, with entire or shortly lobed leaves. Flowers large, yellow.

All younger parts and unripe capsules covered with rusty-coloured scales; seeds shortly tomentose . . . . . *T. populnea.*
All younger parts and usually the leaves beneath shortly stellate-tomentose; unripe capsules densely hirsute; seeds glossy . *T. Lampas.*

1. **Th. populnea,** Corr.; H.f. Ind. Fl. i. 345; Bedd. Sylv. Madr. t. 63.—An evergreen tree (30—35+3—6+3—4), often remaining shrubby, the younger parts all minutely rusty-lepidote, glabrescent; leaves cordate, on rather long petioles, acuminate or almost cuspidate, entire or waved, 4-6 in. long, glabrous, beneath sprinkled with minute rusty-coloured scales; flowers large, pale sulfur, turning reddish, on slender 1-3 in. long pedicels, usually somewhat shorter than the petioles; involucre consisting of 1-3 deciduous small lanceolate leaflets or sometimes quite wanting; calyx bell-shaped, truncate, with 5 minute teeth; capsule depressedly globose, sprinkled with minute scales, but soon glabrous; seeds large, hooked, shortly tomentose.

Hab.—Common in the beach and tidal forests all along the shores from Chittagong down to Tenasserim and the Andamans.—Fl. Sept.; Fr. March-May.—l.—SS. = Sal. Aren.

Remarks.—Wood pale reddish-brown to brown, strong, even-grained, durable, hard. Good for furniture, carpentry, &c.; used for cart-wheels, spokes, &c. Liber yields fibre.

2. **Th. Lampas,** Dalz.; H.f. Ind. Fl. i. 345.—A sparingly branched meagre shrub up to 8 ft. high, the young parts more or less stellate-tomentose; leaves variable in shape and size, cordate or oblong-cordate, entire or shortly lobed, with the lobes acute or blunt, 3-5 in. long, on rather short stellately puberulous petioles, more or less chartaceous, entire, while young usually on both sides stellate-tomentose, glabrescent above; flowers large, yellow with a purple eye, on short thick pedicels of the length of the petioles or a little longer, axillary and solitary, or more usually few together on long axillary peduncles and forming a poor leafy or bracted raceme; involucre consisting of 5 to 7 minute distant leaflets arising from the thickened end of the pedicels; calyx nearly truncate, with 5 distant subulate lobes; capsules ovoid, obtuse, or nearly so, slightly 5-angular, densely tawny hispid, more or less glabrescent when fully ripe; seeds small, club-shaped, black and glossy.

Hab.—Frequent in all leaf-shedding forests, especially the mixed ones, all over Burma; also in savannahs.—Fl. Fr. C. and H.S.—l.—SS. = x.

GOSSYPIUM, L.

Bracteoles 3, leafy, cordate. Calyx truncate or shortly 5-cleft. Staminal column bearing numerous filaments outside. Ovary 5-celled, with several ovules in each cell; style club-shaped, furrowed, with decurrent stigmas. Capsules loculicidally 3-5-valved. Seeds almost globular or angular, woolly or glabrous.—Herbs, shrubs, or little trees, with lobed rarely entire leaves. Flowers large, yellow or purple. Calyx and capsules usually black-dotted.

Annual; seeds free, clothed with firmly adhering silky down . *G. herbaceum.*
Shrubby, perennial; seeds black, free or cohering, devoid of adhering pubescence . . . . . *G. Barbadense.*

1. **G. herbaceum,** L.; H.f. Ind. Fl. i. 346.—*Wah.*—A more or less branched, erect annual or biennial, 2 to 5 ft. high, more or less pubescent; stipules linear, or broadly lanceolate, acuminate; leaves usually more or less deeply 5-3-lobed with the lobes acute or blunt, cordate at base, on a slender petiole ¾-1½ in. long, acute or blunt, pubescent beneath, the principal ribs with or without a gland; flowers large, yellow or sulfur, with or without a purple eye, axillary, solitary, on short pedicels; involucre consisting of 3 broadly cordate acute or acuminate leaflets either entire or more usually variously serrate or cut; capsule 3-5-celled, elliptical or ovate, acuminate; seeds free, clothed with firmly adhering white down and surrounded by white or tawny cotton.

Hab.—Much cultivated in several varieties all over Burma, and often seen as wild in deserted toungyas and neglected lands.—Fl. Fr. C. and HS.—l.—SS.= ∞, *CaAll.*

2. **G. Barbadense,** L.; H.f. Ind. Fl. i. 347.—*Noo-wah.*—A much-branched shrub, usually not more than 5-8 ft. high, but sometimes growing out in a small tree, 15-20 ft. high, quite glabrous, or the softer parts more or less pubescent; leaves more or less broadly 5-lobed, with the lobes acuminate, cordate at base, on rather long slender petioles, more or less hairy or quite glabrous, blackish-dotted, the midrib only or also the 2 lateral nerves with a gland; flowers large, sulfur, or rarely copper-coloured, on short pedicels, axillary and solitary; leaflets of the involucre broadly cordate, acuminate, more or less lacerate, usually broader than in the former species; capsules 3-4-celled, oval or ovate, acuminate; seeds usually adhering firmly to one another, black, free of every pubescence except the white or copper-coloured cotton, which is easily removed.

Hab.—Rarely seen in gardens of Burma.

BOMBAX, L.

Calyx cup-shaped, truncate, or irregularly 3-5-lobed. Staminal column divided into numerous filaments, of which the inner ones

or nearly all in pairs and united at base into 5 or more bundles. Ovary 5-celled, with several ovules in each cell; style club-shaped, or shortly 5-lobed at top. Capsule woody or coriaceous, loculicidally 5-valved, the cells densely woolly inside. Seeds obovoid or globose, enveloped in the wool. Albumen thin.—Leaf-shedding trees, with digitate leaves. Flowers large, scarlet or white.

Leaflets on a 10-12 lin. long petiolule; staminal bundles consisting of 15 to 20 strong and thick filaments; petals broader and shorter, reflexed . . . . . *B. Malabaricum.*
Leaflets decurrent on the 2-3 lin. long petiolule; staminal bundles consisting of 50 or more long filiform filaments; petals longer and straight, with incurved margins . . . . . *B. insigne.*

1. **B. Malabaricum,** DC.; H.f. Ind. Fl. i. 349; Bedd. Sylv. Madr. t. 82; Brand. For. Fl. 31.—*Letpan* or *deedoo.*—A tree (60—80+ 40—50 + 12—15), leafless in HS., all parts glabrous, the trunk cylindrical, of younger trees armed with numerous conical sharp prickles; bark about an in. thick, smooth, grey; cut red; leaves long-petioled, 7-5-foliolate; leaflets elliptically oblong to oblong-lanceolate, 4-5 in. long, on a 10 to 12 lin. long slender petiolule, acuminate at both ends, entire, when full grown coriaceous, glabrous; flowers large, scarlet or white, on short thick pedicels, clustered towards the ends of the prickly branches; calyx about an in. long or somewhat longer, thick coriaceous, usually irregularly and bluntish, but rather deeply, 3- to 4-lobed, silk-hairy within; petals fully 3 in. long, oblong, tomentose outside, scabrously papillose inside; staminal column shorter than the filaments, the latter thick and shorter than the petals, in fascicles of 15 to 20 only, 5 of which are stronger; capsules large, oblong, blunt, 5-angled, almost woody, glabrous; seeds imbedded in silky fine wool.

Hab.—Frequent in all leaf-shedding forests, especially the mixed ones, all over Burma from Chittagong and Ava down to Tenasserim, up to 3,000 ft. elevation.—Fl. HS.; Fr. CS.—l.—SS. = ∞ Sal.

Remarks.—Wood very light, white, or yellowish-white, coarsely fibrous, loose-grained, brittle, very perishable, takes no polish. Used for coffins, in Hindostan also for light packing boxes, fishermen's floats, &c. □′ = 28 pd. Cotton used for stuffing cushions and pillows. Yields the brown múchí ras resin.

2. **B. insigne,** Wall.; H.f. Ind. Fl. i. 349.—A tree (60—100+ 40—60 + 5—16), leafless in HS., all parts glabrous, the stem and branches unarmed; leaves long-petioled, 7-9-foliolate; leaflets obovate or oblong-lanceolate, on a 2 to 3 lin. long rarely longer petiolule, more or less decurrent at base, shortly acuminate, thin coriaceous, glabrous; flowers very large and showy, scarlet or white, on short thick pedicels, forming a lax raceme at the ends of the branchlets; calyx about 1½ in. long or somewhat longer, urceolate-globular, densely silk-hairy inside, usually shortly and

bluntish 2-lobed, finally deeply 2-cleft; petals oblong-lanceolate, blunt, narrowed at base, 5-6 in. long, those of the fallen corollas straight, densely stellate-tomentose outside; staminal bundles consisting of 50 or more unequally long filiform filaments; capsules oblong, woody, 7-10 in. long, obtusely 5-angular, glabrous.

Hab.—Frequent in the upper mixed forests of the Pegu Yomah and the Andamans, up to 3,000 ft. elevation; also Ava.—Fl. H.S.; Fr. C.S.—l.—SS. = SiS.

Remarks.—Wood as in the preceding species.

ERIODENDRON, DC.

Calyx cup-shaped, truncate, or irregularly 3-5-lobed. Staminal bundles 5, united at base, each bearing 2-3 sinuose or linear anthers. Ovary 5-celled with several ovules in each cell; capsule woody or coriaceous, densely woolly inside. Seeds enveloped in the wool; albumen very thin or absent.—Armed or unarmed trees with digitate leaves. Flowers solitary or fascicled, usually white.

1. **E. orientale,** Steud.; H.f. Ind. Fl. i. 350 (*E. anfractuosum*, DC.; Bedd. Sylv. Madr. 30, t. 4, f. 2).—A tree (60—80 + 40—60 + 10—12), shedding leaves in HS., the trunk armed with conical woody prickles, the branches usually ternary and spreading, all parts glabrous; bark grey; leaves on rather long petioles, glabrous, 8-5-foliolate; leaflets lanceolate, very shortly petioluled or almost sessile, acuminate with a mucro, entire or serrulate towards the point, glaucescent beneath; flowers appearing before the leaves, rather large, dull white, on rather long nodding pedicels, fascicled above the scars of the fallen leaves and crowded at the end of the branchlets; petals about an in. long, of a thick fleshy texture, densely tomentose outside; calyx thick coriaceous, bell-shaped, irregularly 5-lobed; anthers linear, serpentinely bent and variously convolute; capsules oblong, smooth, thick and coriaceous; seeds numerous, imbedded in a fine silky wool and slightly adhering to it.

Hab.—Here and there cultivated in Pegu and Tenasserim; a single tree observed wild in the coast forests of South Andaman.

Remarks.—Wood light, good for toys. The cotton of the seeds used in the same way as that of *Bombax*. Gives also a resin.

DURIO, L.

Calyx bell-shaped, 5-cleft, surrounded by an involucre, finally irregularly rupturing. Petals 5, twisted-imbricate. Staminal tube divided into 4 or 5 bundles; filaments many, each bearing a globose head of sinuous 1-celled anthers. Ovary 4-5-celled, with many ovules in 2 series in each cell; styles connate; stigmas capitate. Fruit a very large woody prickly capsule loculicidally 5-valved or

almost indehiscent. Seeds arillate.—Trees with simple leaves, all parts usually more or less silvery or coppery scaly. Flowers in lateral cymes.

1. **D. Zibethinus,** DC.; H.f. Ind. Fl. i. 351.—*Du-yin.*—An evergreen tree (40—60 + 18—13 + 4—8), all softer parts covered with silvery or coppery minute scales; leaves obovate-oblong or oblong, rounded at base, on nearly an in. long or longer densely lepidote petioles, acuminate, chartaceous, glabrous above, beneath densely silvery or coppery scaly; flowers large, 3-4 in. in diameter, forming densely scaly lateral cymes or clusters; involucre 2-cleft, the lobes concave, scaly; calyx with a wide, but short angular tube, 5-lobed, the lobes blunt; anthers sinuous, in globose heads; fruits as large as a child's head and larger, usually more or less globular to ovoid-oblong, the woody valves firmly adhering to one another and covered by sharp conical prickles; seeds large, oblong, covered by a thick, cream-coloured, sappy, deliciously-tasting arillus.

Hab.—Cultivated in Upper Tenasserim; wild and forming forests in Lower Tenasserim from Lat. 14° southwards (Helf.).—Fr. May-June.

Remarks.—A favourite fruit with the Burmese and Malays in spite of its disagreeable smell.

STERCULIACEÆ.

Flowers regular, hermaphrodite, or unisexual. Sepals 5, more or less, rarely wholly, connate. Petals 5 or none. Stamens usually united into a ring cup or tube, many or rarely few and free; anthers 2-celled, in heads, or in a single ring at the apex or dispersed on the outside of the staminal column, with or without intervening staminodes. Ovary free, 2-5-celled, rarely of a single carpel, sessile or stalked, with many or few anatropous ovules attached to the inner angle of the carpels; styles as many as ovary-cells, united or free. Fruit dry or fleshy, dehiscent or indehiscent. Seeds rarely arillate, with or without albumen. Cotyledons leafy, flat, folded or convolute.—Herbs, shrubs, or trees, with alternate, simple, or palmately lobed or digitate leaves. Stipules present. Flowers in axillary or terminal, usually cymose inflorescences.

An order remarkable for the abundance of mucilage which most of the members contain. The seeds of certain *Sterculias* are mucilaginous and purify half-putrid water; of others they are eaten. Many yield gum. The fibre of most *Sterculiaceæ* is strong and good for cordage, and it is for this reason that many species of this order are of importance to the forester, for the wood of most of them is more or less soft and almost valueless. However, *Pterospermum*, *Heritiera*, and a few others yield valuable timber. The cacao, used

in making chocolate, belongs to this order. The greater part of the 42 Burmese species are woody, and some of them reckon amongst the loftiest trees of the country.

* *Carpels distinct in flower and fruit, usually 5 or fewer. Flowers unisexual or polygamous. Petals none.*
Anthers numerous, irregularly clustered; follicles dehiscent . . *Sterculia.*
Anthers 5, in a ring; carpels indehiscent . . . . . *Heritiera.*
** *Carpels united into an entire or lobed ovary or fruit. Flowers hermaphrodite. Petals present.*
○ Anthers turned outwards.
× Petals deciduous.
† Anthers 5-15, usually alternating with staminodes
Anther-cells divaricate or confluent into 1; seeds not winged . *Helicteres.*
Anther-cells parallel; seeds winged . . . . . *Pterospermum.*
†† Anthers numerous; staminodes none . . *Eriolæna.*
×× Petals usually persistent, marcescent.
Ovary 5-celled; stamens 5 . . . . . *Melochia.*
○○ Anthers turned inwards. Petals concave at base.
× Anthers by 2-4 alternating with staminodes.
Capsule 5-winged, dehiscent; arillus none . . . . . *Abroma.*
Fruit globular, muricate, indehiscent; arillus none . . *Guazuma.*
Capsule 2-5-lobed, not winged, dehiscent; seeds arillate. . . *Leptonychia.*
×× Anthers singly alternating with staminodes. . *Buettneria.*

STERCULIA, L.

Flowers polygamous. Calyx tubular or bell-shaped, 4-5-lobed or cleft, often coloured. Petals none. Ovary of 4 to 5 free sessile or stalked radiating carpels with 2 or more ovules in each. Follicles sessile or stalked, woody to chartaceous, dehiscent. Seeds naked or arillate, wingless, or rarely winged. Albumen 2-parted, flat or folded.—Trees or shrubs, with simple or palmately lobed or digitate leaves. Flowers in axillary and terminal panicles.

* *Seeds numerous, winged along their upper end, enclosed in a woody large follicle* . . . . . *St. alata.*
** *Seeds not winged, 2 or more along the suture of the carpels or solitary and laterally adnate to the base of the follicle.*
○ *Follicles coriaceous, not expanded or boat-shaped, simply dehiscent along the ventral suture. Seeds 2 or more along the suture of the carpel.*
× Leaves digitate.
Leaves glabrous; calyx rather large, the purple lobes spreading . *St. fætida.*
Leaves closely greyish puberulous beneath, calyx small, the lobes conniving, short . . . . . *St. versicolor.*
×× Leaves palmately lobed or cut. Leaf-shedding trees.
Carpels densely covered with stiff fragile hairs; flowers small . *St. urens.*
Carpels shortly tomentose from stellate hairs, flowers about ½ in. in diameter . . . . . *St. villosa.*
Carpels densely covered with stiff short hairs, glabrescent; flowers nearly ¾ in. in diameter . . . . . *St. ornata.*
××× Leaves all entire. Small evergreen trees or meagre shrubs.

† Leaves quite glabrous.

Calyx shortly tubular, striate, the lobes erect . . . . . *St. longifolia.*

Calyx almost rotate, the lobes linear, very long, and somewhat twisted . . . . . *St. coccinea.*

†† Leaves more or less tomentose or pubescent, at least beneath.

△ Flowers more than ½ in. long, in simple brown-tomentose racemes . . . . *St. rubiginosa.*

△△ Flowers in panicles.

Leaves tomentose; calyx-lobes free and spreading; flowers long-pediceled . . . . . *St. angustifolia.*

Leaves minutely stellate-puberulous beneath; calyx-lobes short and conniving; flowers shortly pediceled . . . . . *St. parviflora.*

○○ *Follicles chartaceous or membranaceous, leaf-like expanded or boat-shaped.*

× Follicles leaf-like expanded, bearing 1 or 2 seeds along the marginal sutures at about ½ of their length. Flowers scurfy tomentose, crimson.

Leaves more or less lobed, occasionally almost entire, glabrous or puberulous beneath; calyx about 8-9 lin. long . . . *St. colorata.*

Leaves very large, much lobed, pubescent beneath; calyx about 1-1½ in. long . . . . . *St. fulgens.*

×× Seeds solitary and laterally adnate to the base of the boat-shaped follicle.

Follicles produced below at about the middle into an additional sack-like lobe; leaves tomentose or puberulous beneath, rarely glabrous . . . . . *St. campanulata.*

Follicles simply boat-shaped; leaves glabrous, glossy, coriaceous . *St. scaphigera.*

* *Seeds numerous, winged along their upper end, enclosed in a woody large follicle.*

1. St. alata, Roxb.; H.f. Ind. Fl. i. 360 (*St. Heynei,* Bedd. Sylv. Madr. t. 230).—*Let-kope.*—A leaf-shedding tree (80—100 + 60—70 + 8—10), the leaf-buds tawny puberulous; bark rather thick, corky, ash-grey; leaves cordate-oblong, 4-7 in. long (in young trees up to a ft. long), on long glabrous petioles, shortly acuminate or acute, 5- or almost 7-nerved at base, chartaceous, entire, glabrous; flowers about 1½ in. in diameter, greenish, on the outside covered with a rusty-brown scurvy tomentum, purplish inside, on very short thick rusty-tomentose pedicels, forming rusty-scurvy-tomentose axillary racemes usually forming a spurious terminal panicle; calyx almost to the base 5-cleft, bell-shaped, the lobes oblong-lanceolate, stellate-puberulous inside; gynophore slender, minutely puberulous; stamens about 25; ovaries 5, in the female hermaphrodite flowers sessile and surrounded by 5 sessile bundles of imperfect stamens; follicle as large as a man's fist or larger, fibrously woody, nearly obovoid-spherical, long-stalked, clothed with an olive-brown velvety tomentum; seeds large, numerous, attached to the borders of the valves, oblong, compressed, terminated by a long, broad, spongy wing.

Hab.—Frequent in the tropical forests all over Chittagong, Pegu, and Martaban down to Tenasserim; also on the Andamans.—Fl. Febr.-March; Fr. Apr.-May.—s : l.—SS. = Metam., *S/S.*

Remarks.—Wood rather light, coarsely fibrous, yellowish-white, perishable.

* * *Seeds not winged, 2 or more along the suture of the carpels or solitary and laterally adnate to the base of the follicle.*

○ *Follicles coriaceous, not leaf-like or boat-shaped.*

2. **St. fœtida,** L.; H.f. Ind. Fl. i. 354; Bedd. Sylv. Madr. 31.—A large tree (80—90+40—60+8—10), shedding leaves in HS., glabrous, except the young shoots; leaves crowded at the ends of the thick branchlets, long petioled, digitately 5-11-foliolate; leaflets oblong or elliptically oblong, or almost lanceolate, 6-8 in. long, shortly petioluled, narrowed at base, usually acuminate or cuspidate, entire, almost coriaceous or chartaceous, glabrous; flowers rather large, dull-purple, forming lax, simple, or branched glabrous racemes about as long as the petioles; calyx deeply 5-cleft, about an in. across, glabrous outside, densely woolly inside, the lobes lanceolate, spreading; gynophore slender and curved, puberulous; carpels 5, very villous; follicles about 3-4 in. long by 2½ broad, glabrous, and while young somewhat pruinous outside, fibrous inside; seeds 10-15, oblong, large.

Hab.—Upper Tenasserim; also Martaban.—Fl. Apr.-May; Febr.-March.—l.—SS.=Metam.

Remarks.—Wood very light, coarsely fibrous and rather loose-grained, white, then yellowish, takes an indifferent polish. Liber furnishes fibre. Exudes gum resembling tragacanth.

3. **St. versicolor,** Wall.; H.f. Ind. Fl. i. 355.—*Shaw-hpyoo.*—A tree (80—90 + 40—60 + 8—10), remaining stunted in sterile grounds, leafless during HS., the stem grey; leaves digitately 5-foliolate, on a shortly greyish tomentose petiole 6-8 in. long; leaflets oblong-lanceolate, on a 6 lin. long petiolule, acuminate, entire, rather acute at base, 5-7 in. long, glossy and dark-green above, glabrous and canescent or greyish velvety beneath; flowers small, odorous, pale yellow, turning deeply orange, on very short pedicels, racemose, forming greyish pubescent axillary panicles somewhat shorter than the petioles; calyx oblong-bell-shaped, almost fleshy, villous, about 5 lin. long, 5-6- rarely 7-cleft, the lobes short, oblong, bluntish, conniving, but distinct at their tips; gynophore glabrous; ovary densely villous; follicles similar to those of *St. urens,* but larger, oblong, sessile, incurvedly and stoutly acuminate, 2-3 in. long by more than an in. thick, crimson or scarlet, densely velvety, and covered with stiff, fragile bristles, glabrous inside.

Hab.—Frequent in the drier mixed (especially the upper) forests and in the dry forests of Prome and the Pegu Yomah; also Martaban.—Fl. Octob.; Fr. C. & H.S.—l.—SS.=*SiS.,* CaS.

4. **St. urens,** Roxb.; H.f. Ind. Fl. i. 355; Bedd. Sylv. Madr. 32; Brand. For. Fl. 33.—A tree (60—70 + 40—50 + 8—10), leafless

in HS., the softer parts stellately tomentose; bark pale ash-coloured, smooth, peeling off in papery flakes; leaves crowded at the ends of the thick branchlets, about 1-1½ ft. broad and long, usually 5-lobed, with the lobes acuminate (the basal ones often overlapping each other), herbaceous, or somewhat chartaceous, densely tomentose, the tomentum of the upper side very short; flowers rather small, greenish, tomentose, in much-branched tomentose panicles, the pedicels furnished at their bases with long brown linear bractlets; calyx bell-shaped, 5-toothed, 2½-3 lines long; gynophore thick and half as long as the calyx; carpels 5, tomentose; follicles coriaceous, ovate-oblong to oblong, acute at the recurved apex, orange to bright red, covered by a dense short tomentum intermixed with numerous stiff, fragile, pungent hairs; seeds 3-6, oblong, black.

Hab.—Not unfrequent in the drier upper mixed forests of the Pegu Yomah and Martaban, up to 3,000 ft. elevation; also in the mixed dry forests of Prome; Tenasserim.—Fr. March-Apr.—l.—SS.=*SiS.*, Metam., CaS.

Remarks.—Wood soft, spongy, and loose-grained, worthless. □′=33pd. Yields a gum resembling tragacanth. Liber furnishes fibre.

5. **St. villosa,** Roxb.; H.f. Ind. Fl. 355; Bedd. Sylv. Madr. 32; Brand. For. Fl. 32, t. 10.—*Shaw-nee.*—A tree (60—70+40—45+4—6), leafless during HS., the younger parts tomentose; bark smooth, almost glossy, grey, covered with corky warts; cut red; leaves large, rotundate or cordate, palmately 5-7 lobed, 1-1½ ft. each way, on long densely puberulous petioles, 5-7-nerved at base, while young pubescent on both sides, glabrescent above, the lobes acute or acuminate and usually again lobed; flowers numerous, pale yellow, with pink or orange eye, on slender puberulous pedicels, forming larger or smaller more or less pendulous tawny tomentose panicles towards the extremities of the branches; calyx bell-shaped, deeply 5-cleft, puberulous outside; gynophore short, slender and curved, glabrous; stamens 10; ovary puberulous; follicles coriaceous, oblong, bright red, densely and shortly tomentose outside and shortly hispid tomentose inside, about 1½-2 in. long by 1 in. or more thick, almost sessile.

Hab.—Frequent in the upper mixed forests of the Pegu and Prome Yomah and Martaban; also Ava, Tenasserim, and the Andamans.—Fl. H.S.; Fr. Begin. of R.S.—l.—SS. = Metam., *SiS.*

Remarks.—Wood soft, reddish, fibrous. The liber is very strong and lasting, and is made most readily into ropes, and extensively used as such by the Burmese mahouts, etc., to such a degree that the tree has become scarce in the outer hills and in the more accessible forests. Exudes a gum.

6. **St. ornata,** Wall.—*Sha-wa.*—A tree (50—60+25—40+3—5), resembling the former species, shedding leaves in HS., the shoots tomentose from crimson (in a dried state brown), soft, often glandular hairs; cut white; leaves broad, 5-7-lobed, with the lobes

acuminate, beneath densely pubescent with stellate hairs, above sprinkled with minute fascicled hairs; flowers rather large, on ½ to nearly an in. long pedicels, usually pale ochre-coloured with a reddish base, forming several softly tomentose panicles towards the ends of the thick branches; calyx minutely pubescent, half an in. long, the lobes lanceolate, spreading; gynophore stellately tomentose, the anther-heads incurved, in the female flowers the ovaries densely hispid-tomentose; follicles by 5-7, densely covered with pungent nearly a line long fragile hairs, glabrescent, about 2½-3 in. long, rather cylindrical, recurved or incurved-acuminate; seeds several, oblong, black and smooth.

Hab.—Not unfrequent in the tropical forests of the Pegu Yomah and Martaban down to Tenasserim.—Fl. Febr.; Fr. March-Apr.—l.—SS. = *SiS.*, CaS., Metam.

Remarks.—Wood soft, fibrous, white. The liber furnishes cordage equal to that of the preceding species. Exudes gum.

7. **St. longifolia,** Vt. (*St. striatiflora*, Mast. in H.f. Ind. Fl. i. 356).—An evergreen tree, all parts glabrous; leaves obovate-oblong, 8-9 in. long, on a 1-1½ in. long petiole, narrowed towards the base, abruptly and shortly bluntish acuminate, entire, chartaceous, strongly nerved and net-veined, glabrous; flowers about 2½-3 lin. long, on short puberulous pedicels, forming slender puberulous racemes much shorter than the leaves; calyx bell-shaped, on the outside almost ribbed longitudinally and slightly stellate-puberulous, minutely velvety inside; the lobes lanceolate, tomentose along the borders, erect-spreading, nearly as long as the tube; gynophore in male flowers very short; stamens about 15, in a dense head; follicles oblong, about 2-2½ in. long, almost sessile, scarlet, velvety, glabrous inside; seeds ovoid, blackish.

Hab.—Burma, probably Tenasserim.

8. **St. coccinea,** Roxb.; H.f. Ind. Fl. i. 357.—A simple-stemmed evergreen shrub, 2-4 ft. high, not or slightly branched upwards, glabrous, or the young shoots slightly stellate-pubescent; leaves oblong or elliptically lanceolate, 8 to 9 in. long, rounded or obtuse at base, on a glabrous petiole 1-2 in. long, acuminate, entire, chartaceous, glabrous, the nerves and veins very distinct; flowers of a delicate pinkish-rose colour, middling-sized, on slender rather long pedicels, forming slender slightly glandular-pubescent axillary panicles usually shorter than the leaves; calyx rotate, nearly 1½ in. in diameter, deeply 5-cleft, the lobes spreading, from a broad base narrow-linear, woolly inside, sparingly stellate-puberulous outside; gynophore short, glabrous; follicles (in Assam plants) coriaceous, linear-oblong, long recurved-beaked, velvety, brightly crimson, 3-4 in. long, 4-8-seeded.

Hab.—Frequent in the tropical forests of the Pegu Yomah and Martaban down to Tenasserim.—Fl. March; Fr.-Apr.—s.—SS. = SiS., Metam.

9. **St. rubiginosa,** Vt.; H.f. Ind. Fl. i. 358.—A small meagre evergreen shrub of a few ft. only, all parts covered by a tawny or rusty-brown soft tomentum; leaves oblong to obovate-oblong, rounded or obtuse at the narrowed base, abruptly acuminate, on a densely tomentose petiole ⅓ to ⅔ in. long, chartaceous, 4-8 in. long, softly rusty-tomentose, glabrescent above; flowers rusty-tomentose, rather small, on a 3-4 lin. long pedicel, forming rusty-tomentose axillary racemes much shorter than the leaves; calyx deeply 5-cleft, the lobes linear, revolute-bordered, about ⅓ in. long, conniving; follicles cylindrically-lanceolate, about 2 in. long, beaked, velvety, glabrous inside; seeds ½ in. long, black.

Hab.—Burma, probably Tenasserim.

10. **St. angustifolia,** Roxb.—A middling-sized tree, all softer parts tawny pubescent; leaves lanceolate or broadly lanceolate, about 5-7 in. long, on a densely rusty-tomentose petiole 8-10 lin. long or shorter, obtuse or almost rounded at base, acuminate, entire, chartaceous, glabrescent above, beneath densely and softly tawny pubescent; flowers rather small, on about ½ in. long slender villous pedicels, greenish-yellow with a red tinge, forming large tawny or rusty-tomentose panicles, usually much longer than the young leaves; calyx densely tomentose, 5-cleft, the lobes linear, lanceolate, conniving with their tips, woolly inside; gynophore short, pubescent; follicles coriaceous, thick, oblong, almost sessile, incurved acuminate, velvety, scarlet, about 3 in. long, pilose inside.

Hab.—Tenasserim; Andamans, frequent along the coast.—Fl. Febr.; Fr. Apr.-May.

11. **St. parviflora,** Roxb.; H.f. Ind. Fl. i. 359.—A small evergreen tree, about 20 to 25 ft. high, the younger parts rather sparingly stellate-velvety; leaves oval or ovate-oblong, on a tomentose soon glabrescent petiole 6-8 lin. long, 5-6 in. long, rounded at base, shortly acuminate or almost apiculate, membranous, entire, glabrous, beneath minutely stellate-puberulous; flowers small, greenish, on short puberulous pedicels, forming short puberulous panicles of about the length of the petioles; calyx urceolate, 5-cleft, the lobes almost shorter than the tube, conniving with their tips; follicles similar to those of the preceding species, thick oblong, very shortly stalked or almost sessile, curved-beaked, coriaceous, scarlet, velvety, pilose within; seeds oval, black.

Hab.—Ava hills towards Assam.

○ ○ *Follicles chartaceous, leaf-like expanded or boat-shaped.*

12. **St. colorata,** Roxb.; H.f. Ind. Fl. i. 359; Bedd. Sylv. Madr. 32; Brand. For. Fl. 34.—*Wet-shaw.*—A tree (30—50 + 10—25 +

3—4), leafless in HS., the younger parts more or less pubescent; bark grey; leaves broadly ovate or cordate, 3-5-lobed with the lobes short and cuspidate, occasionally undivided, entire, 4-6 in. long, on long slender glabrous petioles, chartaceous, glabrous or puberulous beneath; flowers scarlet, in simple, lax, scurfy-tomentose panicles; calyx clavate-tubular, about 8 or 9 lin. long, 5-toothed, stellate-tomentose outside, velvety inside; gynophore slender, glabrous, somewhat curved, as long as the calyx or somewhat longer; anthers numerous; carpels glabrous; follicles dehiscing very early and leaf-like expanded, chartaceous, oblong, on long slender stalks, glabrous, laxly net-veined, with usually 2 or rarely a solitary oblong seed along the sutures.

Hab.—Frequent in all leaf-shedding forests, all over Burma from Chittagong and Ava down to Tenasserim and the Andamans, up to 3,000 ft. elevation.—Fl. H.S.; Fr. H. and Begin. of R.S.—l.—SS. = ∞ *SiS.*

Remarks.—The liber furnishes inferior cordage.

13. **St. fulgens,** Wall.—A leaf-shedding tree, the younger parts pubescent; leaves nearly 1½ ft. long and broad, cordate-rotundate, 5-lobed, with the lobes acuminate, on long puberulous petioles, above stellately puberulous, beneath similarly tomentose or pubescent; flowers scarlet, 1-1¼ in. long, very much like those of the former, but more tubular, on short scurfy tomentose pedicels, forming scurfy tomentose panicles; calyx clavate-tubular, scurfy stellate-tomentose outside, velvety inside, with a villous ring at base, shortly 5-cleft; gynophore puberulous, half the length of the calyx or somewhat longer; stamens numerous; follicles unknown.

Hab.—Ava; Tenasserim.

14. **St. campanulata,** Wall.; H.f. Ind. Fl. i. 362.—A tree (100—120 80—90 + 6—8), leafless in HS., the young parts more or less tomentose; bark smooth, grey; leaves cordate to cordate-oblong, entire or more or less 3- to 5-lobed with the lobes blunt, more or less acute, on a 1½-2 in. long puberulous petiole, 3- to 5-nerved at base, 3-5 in. long, membranous, glabrescent above, shortly puberulous beneath; flowers green, on short jointed pedicels, forming smooth, pruinous, short, and stiff panicles at the ends of the thick branchlets; calyx bell-shaped, pruinous, 5-lobed, the lobes oblong, acute, velvety along the borders; gynophore glabrous; follicles on slender puberulous stalks, boat-shaped, with a sack-like extension at about the middle, chartaceous, nerved, and minutely puberulous; seed solitary at the base of the follicle, puberulous.

Hab.—Frequent in the tropical forests along the eastern slopes of the Pegu Yomah and Martaban.—Fl. March; Fr. Apr.—s: l.—SS. = SiS., Metam.

Remarks.—Wood soft, white, coarsely fibrous, and rather loose, but straight-grained, very light and perishable, takes polish. Exudes a gum resembling tragacanth.

15. **St. scaphigera,** Wall.; H. f. Ind. Fl. i. 361.—A tree (90—120+50—70+6—10), shedding leaves in HS., all parts glabrous; bark greyish-brown, ½ in. thick, peeling off in irregular concave pieces; cut reddish, very fibrous; leaves oblong to ovate-oblong, obtuse or rounded and strongly 3-nerved at base, bluntish acuminate, on a 1½-3 (in young trees up to 5) in. long petiole, 5-8 in. long, entire, coriaceous, glabrous; flowers 3½-4 in. in diameter, on very short and thick puberulous jointed pedicels, forming rather short, robust, much-branched puberulous panicles at the end of the thick branchlets; calyx almost rotate, usually deeply 5-cleft, pale orange or yellowish with a reddish base, in bud greyish-puberulous, finally sparingly stellate-puberulous, glabrous inside, the lobes oblong-lanceolate, acute; gynophore slender, curved, glabrous; anthers about 10-15; follicles 6-8 in. long, boat-shaped, open already in flower, herbaceous, turning chartaceous, much nerved and veined, more or less puberulous outside and shortly greyish tomentose on the nerves and short stalk; seed solitary, the size of a cherry, obovoid or almost globose, exalbuminous.

Hab.—Frequent in the tropical forests along the eastern and central slopes of the Pegu Yomah and Martaban; also Chittagong and Tenasserim.—Fl. Febr.-March; Fr. March-Apr.—s: l.—SS.=*Metam.* SiS. Lat. p.

Remarks.—Wood rather light, coarsely fibrous, loose-grained, white, very perishable. Liber yields a fibre.

HERITIERA, Ait.

Flowers unisexual. Calyx 4-7- (usually 5-) cleft. Petals none. Staminal column slender, bearing a ring of 5 anthers; anther-cells parallel. Ovary-carpels usually 5, nearly distinct, with a single ovule in each; style short, with 5 rather thick stigmas. Fruit-carpels woody, indehiscent, keeled, or almost winged on the back. Albumen none.—Trees, with simple leaves silvery-scaly beneath. Flowers small, in axillary panicles.

* *Carpels smooth and usually glossy, brown; leaves shortly petioled.*
Leaves usually cordate or rounded at base; carpels firmly crustaceous, obliquely ovoid with a sharp keel pointed at the top . *H. littoralis.*
Leaves usually narrowed at base; carpels fibrous-woody under the thin epicarp, obliquely and broadly depressed, the keel at the summit broad and almost wing-like . . . . . *H. minor.*
** *Carpels glaucous green or grey, roughish and corky-tubercled; leaves long-petioled* . . . . . *H. macrophylla.*

1. **H. littoralis,** Dry.; H. f. Ind. Fl. i. 363; Bedd. Sylv. Madr. 33, t. 11, f. 6.—*Penglai-kana-so.*—An evergreen tree (20—30+4—6+4—5), all the softer parts silvery-scaly; bark grey; leaves oblong or oblong-lanceolate, on a thick, silvery scaly petiole ½-1 in. long, usually rounded or slightly cordate at base, 4-6 (of the shoots 8-12) in. long, almost blunt or acute, entire, coriaceous, beneath

densely silvery lepidote with an admixture of a few rusty-coloured scales; flowers small, numerous, dull orange-coloured, on slender tomentose pedicels, forming lax, rusty or tawny tomentose and somewhat scurfy or scaly panicles in the axils of the leaves or above the scars of the fallen ones; calyx bell-shaped, tawny tomentose, nearly 1½ lin. long, acutely 5-toothed; staminal column in the males and gynophore in the female flowers much shorter than the calyx; carpels 5-2, sessile, 1½ to nearly 2 in. long, oval, woody, smooth, glossy brown, sharply compressed and rounded at the apex, with a slightly projecting inner edge, and a strong almost winged keel along the outer edge.

Hab.—Frequent in the tidal forests all along the sea-shore from Chittagong down to Tenasserim and the Andamans.—Fl. Apr.-May; Fr. May.—l.—SS. = Sal.

Remarks.—Wood brown, rather light and loose-grained.

2. **H. minor,** Lam. (*H. fomes,* Buch.; H. f. Ind. Fl. i. 363).—*Penglai-kana-so.*—An evergreen tree, 30—40 ft. high by 4—5 ft. girth, all the softer parts silvery scaly; leaves broadly or almost obovate-lanceolate to oblong-lanceolate, on a thick silvery scaly petiole ½-1 in. long, usually narrowed towards the acute or obtuse base, 4-6 in. long, acute or blunt, rarely rounded, coriaceous, beneath densely silvery lepidote with an admixture of numerous minute rusty-coloured scales; flowers dull orange-coloured, on slender pedicels, forming rusty-tomentose panicles; carpels sessile, obliquely depressed-obovoid, fibrous-woody with a thin fragile brown smooth epicarp furrowed inside, the keel winged along the outer edge.

Hab.—Frequent in the tidal forests all along the Burmese shores from Chittagong down to Tenasserim, ascending the rivers as far as the tidal waves.—Fl. Febr.-June; Fr. R. S.—SS. = Sal.

Remarks.—Wood brown, strong, tough and durable. W = □′ = 66; breaking weight = 1,132 pd. Used for boats, piles of bridges, house-posts, rafters, &c.

3. **H. macrophylla,** Wall.—An evergreen tree, all softer parts silvery scaly; leaves large, ovate-oblong or oblong, on a 2-4 in. long slightly lepidote petiole, rounded and often slightly sinuate at base, 7-12 in. long, acute or shortly acuminate, coriaceous, beneath silvery lepidote; flowers pinkish rose-coloured, small, densely tawny puberulous, on short puberulous pedicels, forming large densely tawny puberulous panicles in the axils of the leaves; calyx shortly 5- rarely 6- or 7-lobed, the lobes acute; carpels woody, almost obliquely oval, glaucous green, roughish from greyish scales and small corky pustules, the keel on the inner side conspicuous, on the outside obsolete, produced in a rather long coriaceous wing-like appendage.

Hab.—Upper Tenasserim.

HELICTERES, L.

Bractlets small, or remote from the calyx. Calyx tubular, 5-cleft at the top, often unequal and oblique. Petals 5, equal, or the 2 upper ones larger, clawed. Staminal column adnate to the gynophore, elongate, truncate at the top or more frequently bearing 5 teeth or lobules with 1 or 2 filamented anthers between them; anther-cells often confluent into one. Ovary sessile or nearly so on the summit of the staminal column, 5-celled, with several ovules in each cell; styles 5, more or less connate. Capsule consisting of 5 straight or spirally twisted carpels opening along their inner edge. Albumen scanty.—Shrubs, rarely trees, with simple leaves often stellate-hairy. Flowers axillary, solitary, fascicled, or racemose.

* *Carpels spirally twisted; leaves unequally serrate* . . *H. Isora.*
* * *Carpels straight or nearly so.*
○ Calyx about 4-6 lin. long or longer. Leaves unequally serrate or toothed.
† Calyx-tube terete.
Calyx laxly stellate, woolly, and viscid . . . . . *H. viscida.*
Calyx shortly scurfy tomentose . . . . . *H. hirsuta.*
†† Calyx-tube 5-gonous, woolly tomentose, the leaves obsoletely and remotely repand . *H. lanata.*
○ ○ Calyx only 2 or 3 lin. long.
× Carpels firmly cohering, forming a densely villous-echinate, apiculate, or blunt capsule.
Stems tawny tomentose; leaves sprinkled above with stellate hairs, blunt or acute . . . . . *H. obtusa.*
Stems glabrescent, leaves glabrous above, acuminate . . . *H. lanceolata.*
× × Carpels loosely cohering, with the points all free, shortly hairy echinate.
Flowers in short axillary racemes . . . . . *H. plebeja.*
Flowers in elongate slender racemes usually much longer than the pubescent leaves . . . . . *H. elongata.*

1. **H. Isora,** L.; H.f. Ind. Fl. i. 365; Bedd. Sylv. Madr. 33, t. 5, f. 1; Brand. For. Fl. 34.—*Thoo-gnai-chay.*—A large shrub, 6-10 ft. high, all parts stellately tomentose; leaves broadly ovate or oblong, sometimes obsoletely lobed, usually obliquely rounded or cordate at base, on a short tomentose petiole, shortly acuminate or acute, irregularly toothed, 2-4 in. long, membranous, above rough from stellate hairs, beneath densely and often greyish tomentose; flowers rather large, brick-coloured or red, on short tomentose pedicels, usually in axillary or extra-axillary poor tomentose fascicles; calyx about ½ in. long, shortly and roughish stellate-tomentose, almost curved, obliquely and unequally 5-toothed; petals an inch long, two of them much broader, truncate or sinuate, minutely ciliate at summit, on a linear abruptly toothed claw of the length of the blade itself; anthers 10, on short filaments, alternating in pairs with the linear staminodes round the ovary;

capsules about 1-1½ in. long, long-stalked, consisting of 5 linear many-seeded minutely stellate-tomentose carpels spirally twisted and terminating in a thick point.

Hab.—Burma (probably Ava?)

2. **H. viscida,** Bl.—A shrub, all parts covered with a lax, short, viscid tomentum; leaves cordate-oblong or cordate-rotundate, almost 3-lobed towards the extremity, on a short villous petiole, acuminate, irregularly serrate-toothed, membranous, above sprinkled with short soft hairs, beneath softly viscid-pubescent or loosely viscid-tomentose; flowers rather large, on short pedicels, forming rather short axillary viscid-pilose racemes much shorter than the leaves; calyx about 6 lin. long, loosely and viscidly stellate-woolly, terete; petals twice as long as the calyx, on a linear abruptly toothed claw longer than the blade itself; stamens 10; capsules on a long glabrous stalk, densely covered with stellate-pilose filiform soft prickles, the carpels straight, firmly united, and terminating in a short blunt point.

Hab.—Ava.

3. **H. hirsuta,** Lour.—A shrub, all parts more or less densely tomentose; leaves varying from oblong and ovate-oblong to oblong-lanceolate and lanceolate, unequal at the rounded or slightly cordate base, 3-or almost 5-nerved, on a tomentose petiole varying much in length, acute or acuminate, unequally toothed, 3-4 in. long, membranous, densely and somewhat roughish puberulous or almost tomentose above, beneath shortly and softly and often greyish stellate-tomentose; flowers rather large, of a dull purplish brown colour, very shortly pedicelled, forming simple, shortened, or elongate tomentose racemes in the axils of the leaves and shorter than them; calyx about 6 lin. long, terete, shortly stellate-tomentose; petals nearly twice as long, on long, slender, abruptly toothed claws; stamens 10; capsules about 1-1¼ in. long, on a long glabrous stalk, densely covered by stellate villous long subulate soft prickles, the carpels straight and firmly cohering, terminating in a short rather blunt point.

Hab.—Tenasserim.—Fl. March.

4. **H. lanata.** (*Oudemansia lanata,* T. & B.).—An evergreen middling-sized shrub, all parts stellate-tomentose; leaves ovate, rounded or rarely almost cordate at the base, on a stout woolly petiole only 2-3 lin. long, acuminate, obsoletely repand, membranous, 5- or almost 7-nerved from the base, 3-5 in. long, above fugaceously lanate, beneath whitish and stellately woolly tomentose; flowers small, dark-purple, on very short thick pedicels forming by 3-6 small woolly tomentose poor cymes on axillary peduncles not above ½ in. long; calyx tubular, 5-cornered, about 4-4½ lin. long,

woolly tomentose, 5-toothed; petals glabrous, not much longer than the calyx; staminal tube pilose at the middle; ovary pilose, the style glabrous.

HAB.—Adjoining provinces of Siam.

5. **H. obtusa,** Wall.; H.f. Ind. Fl. i. 366.—A small shrub, all softer parts shortly tawny tomentose; leaves oblong to oblong-lanceolate, on short tawny tomentose petioles, obtuse or rounded at the 3-nerved base, blunt or acute and usually mucronate, 2-2½ in. long, chartaceous, entire, above sprinkled with short stellate hairs, beneath shortly tawny stellate-tomentose; flowers small, shortly pediceled, forming very short axillary shortly tawny tomentose poor slender racemes; calyx about 2 lin. long, shortly stellate-tomentose and somewhat scurfy; petals somewhat longer; staminal column glabrous; capsules oblong, short, about 7-8 lin. long, densely covered with long villous filiform soft prickles, the carpels closely cohering, blunt or nearly so.

HAB.—Tenasserim.—Fl. June; Fr. Jan.-Apr.

6. **H. plebeja,** Kz.; H.f. Ind. Fl. i. 366.—A small shrub, all softer parts scabrous from short stellate hairs; leaves ovate-lanceolate to ovate-oblong, on a short but slender petiole, rounded at base, about 3-5 in. long, more or less irregularly toothed, acuminate, membranous, above almost glabrous or sparingly and shortly hairy, beneath scabrous from minute stellate hairs, while young densely greyish-stellate-pubescent, rarely the tomentum persistent; flowers small, pale-lilac, shortly pediceled, forming poor slender stellate-puberulous fascicles in the axils of the leaves; calyx about 2½ lin. long, sparingly stellate-hairy; petals somewhat longer than the calyx; capsules 8-10 lin. long, stellate-tomentose and softly prickly, the carpels soon separating and terminating in more or less spreading subulate points.

HAB.—Frequent in the mixed, especially the upper mixed forests of Arracan, Pegu, and Martaban, up to 3,000 ft. elevation.—Fl. Oct.-Sept.; Fr. Jan.-Febr.—s+l.—SS.= *SiS.*, Metam.

7. **H. elongata,** Wall.; H.f. Ind. Fl. i. 365.—Much like the former, the leaves more or less stellate-pubescent beneath and less so above; flowers springing from slender, elongate, often 3-4 in. long, leafless, axillary branchlets, rarely in short fascicles, as in *H. plebeja.*

HAB.—Ava.

PTEROSPERMUM, Schreb.

Bracteoles 3, entire or cut, sometimes very deciduous. Calyx tubular, 5-cleft, deciduous. Petals 5, deciduous. Staminal column

adnate to the gynophore, at the summit divided into 5 linear staminodes alternating with as many trios of filamented anthers; anther-cells linear, parallel. Ovary sessile on the summit of the column, 5-celled with several ovules in each cell; style simple. Capsule woody or coriaceous, opening loculicidally in 5 valves. Seeds produced into a terminal wing. Albumen little or none.—Trees and shrubs, with simple, entire or more or less lobed leaves. Flowers usually showy, axillary. Stipules entire or cut.

* *Capsules distinctly 5-cornered. Leaves large and broad.*

Bractlets and stipules pinnatifid . . . . . *Pt. acerifolium.*

Bractlets entire . . . . . *Pt. aceroides.*

** *Capsules terete or nearly so.*

○ Leaves semisagittate at base; stipules pinnatifid . *Pt. semisagittatum.*

○○ Leaves not semisagittate at base.

† Pedicels much longer than the petioles . . *P. lanceæfolium.*

†† Pedicels short, about the length of the petioles, or rarely a little longer.

Leaves entire, acuminate, beneath rusty (rarely greyish) tomentose; stipules and bractlets linear-subulate with a cucullate basal appendage . . . . . *P. cinnamomeum.*

Leaves usually angular at summit; stipules and bractlets entire, lanceolate, without appendage . . . . . *P. javanicum.*

1. **Pt. acerifolium,** Willd.; H.f. Ind. Fl. i. 368; Bedd. Sylv. Madr. 35; Brand. For. Fl. 35, t. 11.—*Toung-hpet-woon.*—An evergreen tree (40—50+20—25+3—4), all younger parts covered by a tawny stellate somewhat scurfy tomentum; bark about $\frac{1}{3}$ in. thick, grey, peeling off in small convex pieces; cut red; leaves ovate-oblong or oblong, those of the young trees or shoots very large and palmately 5-lobed, the older ones peltate or deeply cordate, usually palmately 5-nerved, on a 1-4 in. long petiole, shortly truncate 3-lobed at apex, distantly repand, toothed or entire, coriaceous, glabrous above, beneath tawny or yellowish-grey tomentose with an intermixture of rusty-coloured fugaceous wool; flowers very large, white, on very short pedicels or almost sessile, arising by 2 or 3 from the axils of the leaves; bractlets small, tomentose, and, like the stipules, pinnatifid; calyx 4-5 in. long, revolute, thick coriaceous, linear, rusty stellate-tomentose outside, velvety and appressed pubescent inside; petals cuneate-linear and oblique; style towards the base and ovary tawny stellate-tomentose; capsules woody, oblong, 5-angled, fully 6 in. long, 5-celled, covered by a dark-brown scurfy fugaceous tomentum.

Hab.—Frequent in the tropical and moister upper mixed forests along choungs, all over Burma from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. H. S.; Fr. C. S.—s.—SS.=Metam. *SiS.* CaS.

Remarks.—Wood rather heavy, brown, coarsely fibrous, takes a fine polish.

2. **Pt. aceroides,** Wall.—An evergreen tree, (40—50+20—25+3—4), all softer parts densely tomentose; leaves oblong or broadly oblong, usually a little oblique, those of the younger trees palmately

5-7-lobed, on a rather short greyish tomentose petiole, 5-7-nerved, deeply and usually unequally cordate at base, shortly acuminate or apiculate, glabrous above, beneath greyish or tawny tomentose; stipules ...; flowers large, white, on short thick pedicels, arising by 3 or 2 from a short axillary tomentose peduncle; bractlets oblong-lanceolate, tomentose, entire; sepals 2-3 in. long, very thick coriaceous, from the middle recurved, linear, rusty tomentose and striate outside, tawny stellate-pubescent and yellow on the inner side; petals white, almost tubular-connivent and erect, unequally obovate; stamens in bundles of 5, each bundle alternating with a long linear staminode, all united at the very base; style glabrous; ovary tawny tomentose; capsules oblong, 5-angled.

Hab.—Tenasserim and Andamans, in tropical forests.—Fl. H. S.—s.—SS.= SiS. Metam.

Remarks.—Wood exactly like that of the former species.

3. **Pt. semisagittatum,** Roxb.; H.f. Ind. Fl. i. 368.—*Na-kyay-pen* or *najyay-pen.*—A tree (50—60 + 25—30 + 3—6), shedding leaves in HS., all the younger parts more or less tawny tomentose; bark grey, 1-2 lin. thick, peeling off in rounded, concave, irregular and rather large flakes, longitudinally channelled; leaves oblong or oblong-lanceolate, on a very short petiole, unequally cordate or rounded at base with the one lobe much larger and usually more or less sagittately produced, 7-8 in. long, acuminate, entire, chartaceous, glabrous above, greyish (along the strong nerves tawny) tomentose; stipules finely pinnatifid; flowers large, white, on short rusty tomentose pedicels, usually solitary, terminal and axillary; bracts usually 3, very large, and forming a woolly involucre, 3-5 cleft, the segments variously lobed and pinnatifid-fringed; calyx about 4 in. long, the sepals reflexed, linear-lanceolate, thin coriaceous, stellate-tomentose and 3-nerved outside, velvety inside; ovary and base of style tawny stellate-tomentose; capsules almost terete, ovate-oblong, blunt, narrowed in a thick short stalk, woody, covered with copious brown fugaceous stellate and somewhat furfuraceous tomentum, 5-celled, 2-3 in. long.

Hab.—Frequent in the mixed and dry forests all over Burma from Chittagong and Ava down to Tenasserim.—Fl. H. S.; Fr. C.S.—s × l.—SS. = ∞*SiS.*

Remarks.—Wood heavy, brown, close-grained.

4. **Pt. lanceæfolium,** Roxb.; H.f. Ind. Fl. i. 368; Brand. For. Fl. 35.—An evergreen tree, all younger parts greyish or whitish tomentose; leaves lanceolate, somewhat unequal, usually unequally rounded at base, on a shortly tomentose petiole 2-3 lin. long, acuminate, usually 4-5 in. long, entire, coriaceous, glabrous above, shortly greyish or whitish tomentose beneath; stipules small, 2-3-cleft, linear-subulate; flowers rather large, white, solitary, on a 1-2 in.

long shortly tomentose peduncle; bracts 2-3- rarely 1-cleft, subulate, tomentose; sepals nearly 1½ in. long, reflexed, linear, coriaceous, striate and tawny or greyish tomentose outside, velvety and appressed hirsute inside; filaments and style sparingly stellate-puberulous; ovary and style-base shortly tomentose; capsules oblong, tapering into a short stalk, acute or acuminate, terete, woody, covered by a thin seceding greyish or whitish tomentum, the cells 2-4-seeded.

HAB.—Chittagong.

REMARKS.—Wood strong, close-grained.

5. **Pt. cinnamomeum,** Kz.—An evergreen tree (30—40+20—25 +3—4), all softer parts brownish tomentose; the bark dark-brown, even, about ⅓ in. thick, peeling off in recurved thin flakes; cut red; leaves obliquely oblong or ovate-oblong, unequally cordate or rounded at the one and acute at the other side of the base, on a thick tomentose petiole 1 or 2 lin. long, 2½-5 in. long, acuminate or cuspidate, chartaceous, glabrous and glossy above, densely tawny or rarely greyish tomentose beneath; stipules subulate, up to an inch long, simple, or more usually with a basal cucullate appendage; flowers large, white, on ½-1 in. long tawny floccose-tomentose peduncles furnished with long subulate bractlets at base cucullate-appendaged, arising solitary from the axils of the leaves; sepals about 1½ in. long or somewhat longer, linear, nerved and tawny tomentose outside, almost glabrous inside; filaments and style glabrous; ovary densely tawny villous; capsules oblong, obtusely 5-angled, tapering at both ends, woody, 2 in. long, covered by a very fugaceous brown or tawny tomentum, the cells 2-seeded (?).

HAB.—Not unfrequent in the tropical forests of Martaban; also Tenasserim. —Fr. March.—s.—SS.=Metam.

REMARKS.—Wood red-brown, rather heavy, coarsely fibrous, rather close-grained, perishable.

6. **Pt. javanicum,** Jungh. (*Pt. Blumeanum,* Korth).—An evergreen tree, all softer parts greyish or pale brownish tomentose; stipules entire; leaves small, obliquely oblong or trapezoid-oblong, acute at the one and rounded at the other side of base, on a densely tomentose petiole 1-2 lin. long, 1½-3 in. long, rather abruptly acuminate, almost glabrous and glossy above, densely velvety tomentose beneath; flowers large, white, on a ⅓-½ in. long velvety peduncle, arising solitary from the axils of the leaves; bracts entire; sepals obscurely nerved, linear, 1-1¼ in. long, tawny tomentose outside and similarly appressed pubescent inside; filaments and style glabrous; ovary and style-base tawny villous; capsule ovoid-oblong, about 1-1½ in. long, at base contracted into a short thick stalk, covered by a dense brown seceding tomentum.

HAB.—Tenasserim.

ERIOLÆNA, DC.

Bractlets 3 to 5, either deeply cleft or lobed, or small and usually caducous. Calyx 5-cleft or finally 5-parted, valvate. Petals 5, deciduous, with dilated tomentose claws. Staminal column short, bearing on the outside numerous linear-oblong anthers, the anther-cells parallel. Staminodes none. Ovary sessile, 5-10-celled with many ovules in each cell; style erect with as many spreading stigmas as ovary-cells. Capsule woody, opening loculicidally. Seeds winged above. Albumen thin.—Trees, with simple, often lobed leaves. Flowers usually yellow and showy, solitary, or several on axillary peduncles.

1. **E. Candollei,** Wall.; H.f. Ind. Fl. i. 370.—*Dwa-nee.*—A tree (30—60+15—30+7—3), shedding leaves in HS., the younger parts stellate-tomentose; bark grey, about an in. thick, shortly and narrowly fissured; cut dry, reddish; leaves ovate-cordate, on long tomentose or glabrescent petioles, 5-12 in. long, acuminate, unequally and bluntish crenate-toothed, while young on both sides tomentose, finally glabrous above; stipules lanceolate, small, deciduous; flowers large, yellow, on an in. long petiole, forming terminal and axillary somewhat tomentose racemes nearly as long or longer than the young leaves; bractlets 3, oblong-linear, pectinate-toothed, or almost pinnatifid, tomentose; petals about an in. long, the claw incurved; stigma 8-10-lobed; capsules woody, ovate, acuminate, about 2 in. long, roughish, 8-10-valved.

Hab.—Not unfrequent in the dry and low forests, rarely in the mixed forests of Prome and Ava down to Martaban and Pegu.—Fl. H.S.; Fr. C.S.—I.—SS. = *SiS.* Metam. All.

Remarks.—Sapwood pale-brown, the heart-wood of a beautiful brick-red colour, tough and elastic; used for gunsticks, paddies and rice-pounders. □ = 47 pd.

MELOCHIA, L.

Sepals 5, connate at base. Petals as many, marcescent. Stamens 5, opposite to the petals, at base united into a short tube; anthers extrorse, 2-celled, the cells parallel. Ovary sessile, 5-celled, with 2 ovules in each cell; styles 5, free or connate at base. Capsule loculicidally 5-valved. Seeds albuminous.—Herbs or undershrubs, rarely small trees, with simple leaves. Flowers small, clustered or loosely panicled.

1. **M. velutina,** Bedd. Sylv. Madr. 35, t. 5, f. 3.; H.f. Ind. Fl. i. 374.—A small tree, 20 to 30 ft. high, or remaining shrubby, all younger parts velvety tomentose; leaves cordate-orbicular, 6-8 in. long and broad, on a long tomentose petiole, acuminate, serrate,

membranous, shortly puberulous above, softly velvety tomentose beneath; stipules broadly cordate, large, more or less pubescent; flowers small, pale-rose coloured or sometimes white, on very short tomentose pedicels, forming large tomentose corymb-like long-peduncled panicles at the end of the branchlets or in the axils of the leaves; calyx greyish tomentose or pubescent; capsules oblong, about 3 lin. long or somewhat longer, hirsute, deeply 5-lobed, the mature carpels separating and terminating in a subulate hirsute point; seeds solitary in the cells, brown, smooth, winged at the extremity.

Hab.—Rather rare in the tropical forests of Pegu, Martaban, and Tenasserim.—Fl. R.S.

Remarks.—Wood whitish, very light, even-grained, soft, silvery-glossy. Good for nothing but children's toys.

GUAZUMA, Plum.

Sepals 5, united almost to the middle, at first spathaceous. Petals 5, concave at base, at the apex produced into 2 narrow strap-shaped appendages. Stamens 10, connate in a column, tubular at base and terminated by 5 fertile 3-antheriferous filaments alternating with as many lanceolate staminodes; anthers 2-celled, the cells diverging. Ovary sessile, 5-lobed and -celled, with numerous ovules in each cell; styles more or less connate. Capsule oblong, woody, tubercled. Seeds albuminous.—Trees, with simple leaves and small flowers in axillary cymes.

1. **G. tomentosa,** H. B. K.; Bedd. Sylv. Madr. t. 107; H.f. Ind. Fl. i. 375.—An evergreen tree (30—60+10—30+2—5), the softer parts shortly stellate-tomentose; leaves unequally ovate or ovate-oblong, about 4-5 in. long, rather short petioled, unequally cordate at base, acuminate, irregularly toothed, above scabrous from minute stellate hairs, beneath shortly tomentose; flowers small, yellow or dark-purple, forming peduncled short usually dichotomously branched cymes in the axils of the leaves; capsules woody, indehiscent, oblong or almost globular, echinate-tubercled, black, many-seeded.

Hab.—An American tree sometimes seen planted as an avenue tree.—Fl. R. S.; Fr. C. S.

Remarks.—Wood light, loose-grained, light-brown or brown, streaked, coarse-fibrous, takes good polish, and is good for furniture, packing cases, &c. The young bark abounds in mucilage used in Mauritius for clarifying sugar.

LEPTONYCHIA, Turcz.

Sepals 5, valvate. Petals 5, shorter than the sepals, concave, valvate. Staminal column tubular below, above divided into 3 series of

filaments, the outer series consisting of 10-15 ligulate staminodes, the median of 10 fertile stamens, and the innermost of 5 very short subulate staminodes; anthers linear-oblong, introrse. Ovary sessile, 3-5-celled, with several ovules in each cell; styles connate; stigmas capitellate. Capsules 5-2-, rarely by abortion 1-celled, dehiscing septicidally or loculicidally, or both. Seeds with a scarlet arillus. Albumen fleshy.—Small trees or shrubs, with simple leaves and small cymose axillary flowers.

Outer staminodes 15, the inner staminodes ciliate; capsule rugose. *L. glabra.*
Outer staminodes 10, the inner not ciliate; capsule minutely tubercled . . . . . *L. heteroclita.*

1. **L. glabra,** Turcz.; H.f. Ind. Fl. i. 379.—An evergreen shrub (?), the leaf-buds slightly puberulous; leaves oblong to oblong-lanceolate, on ½-¾ in. long petiole, obtuse at base, acuminate, 5-7 in. long, chartaceous, glabrous, drying blackish; flowers rather small, in an almost sessile puberulous axillary small cyme; petals almost rotundate, retuse; outer staminodes 15, inner staminodes ciliate; capsule ½ in. long, coriaceous, wrinkled.

Hab.—Tenasserim.

2. **L. heteroclita,** Kz. (*L. moacurroides,* Bedd. Sylv. Madr. t. 114).—An evergreen shrub, growing out into a little tree, the young shoots minutely puberulous; leaves lanceolate to oblong-lanceolate, on a rather short but slender petiole, acuminate, almost entire, 2-4 in. long, membranous, glabrous; stipules linear, minutely puberulous, deciduous; flowers small, whitish, pedicelled, forming a very short peduncled poor puberulous cyme in the axils of the leaves; sepals linear-lanceolate, acute, 3-3½ lin. long, puberulous inside; petals hardly a line long, broadly oblong, 2-lobed, greenish, puberulous; capsules tubercled-rough, usually 3- rarely 4-5-lobed and -celled, with a single or occasionally 2 oblong black seeds entirely enveloped in the scarlet arillus.

Hab.—South Andaman, in the tropical forests.

BUETTNERIA, L.

Sepals 5, connate at base. Petals 5, with a concave claw, the limb produced into a long strap-shaped 2-cleft appendage. Stamens 10, bearing 5 fertile stamens alternating with as many staminodes at base united in a membranous tube; anthers extrorse. Ovary sessile, 5-celled, with 2 ovules in each cell; style simple or 5-cleft; capsule globose, armed with prickles or spines, septicidally opening into 5-1-seeded valves. Albumen none.—Herbs or shrubs, usually climbing or scandent, with simple, lobed, or entire leaves. Flowers small, in branched axillary or terminal umbel-like cymes.

× Leaves cordate-oblong, entire.

Capsules about 1½ in. thick, greyish velvety, covered with strong woody prickles . . . . . *B. aspera.*

Capsules ½ in. in diameter, quite glabrous, woody prickly . . *B. echinata.*

×× Leaves more or less lobed or angular. Capsules the size of a cherry.

More or less roughish stellate-tomentose; capsules densely covered with brown setose flexible bristles . . . . . *B. pilosa.*

Glabrous or almost so; capsules covered with long, stiff, smooth bristles . . . . . *B. Andamanensis.*

1. **B. aspera**, Colebr.; H.f. Ind. Fl. i. 377.—A large scandent shrub, the trunk often 2-3 ft. in girth, the younger parts minutely puberulous; bark brown; leaves cordate-oblong, on a glabrous or minutely puberulous petiole 2½-5 in. long, shortly cuspidate, entire, chartaceous, glabrous above, sparingly and minutely stellate puberulous beneath, but soon quite glabrous; flowers small, yellowish and puberulous outside, pinkish inside, on long, slender, greyish, puberulous pedicels collected into little umbels and forming greyish puberulous branched cymes in the axils of the leaves; petals fleshy, shorter than the sepals, cuneate, with a recurved tooth on the borders, narrowed into a purple incurved claw, the blades conniving with their 2-cleft tips, a little below of which arise the filiform pubescent processes; capsules woody, 1-2 in. in diameter, almost globular, dirty grey and roughish velvety from a minute stellate tomentum, echinate from short, strong, rather distant sharp prickles, 5-celled; seeds solitary in the cells, ovate-oblong.

Hab.—Not unfrequent in the tropical forests from Pegu and Martaban down to Tenasserim and the Andamans.—Fl. Apr.-May—s: l.—SS.=SiS. Metam., &c.

2. **B. echinata**, Wall. (*B. crenulata*, Mast. in H.f. Ind. Fl. i. 376 in part, not of Wall.).—Probably a climber; leaves elliptical to elliptically ovate, rounded at the base, shortly acuminate, on a slender about 1-1½ in. long petiole thickened at both ends, 3-nerved at the base, chartaceous, obsoletely crenulate, glabrous, 1½-3 in. long; capsule globose, ½ in. thick, glabrous, covered with rather distant subulate acuminate prickles of 2-3½ lin. length.

Hab.—Pegu.

3. **B. pilosa**, Roxb.; H.f. Ind. Fl. i. 377.—*Tat-taya-nway.*—A large scandent shrub, the stems as thick as a man's thigh, all softer parts sprinkled with scabrous stellate and simple short hairs; leaves cordate-rotundate, 5 to 6 in. each way, on a stellate hirsute petiole 4-5 in. long, shortly 3-5-lobed with the lobes acuminate, serrate-toothed, membranous, on both sides sprinkled with short stellate roughish hairs, beneath while young softly tomentose; flowers small, yellowish, on short but slender pedicels, in little umbels forming short compound puberulous cymes in the axils of the

leaves; calyx-lobes whitish; petals much shorter, linear, purple towards the base, 2-cleft at the summit and produced below the apex in a long linear yellow process; capsules the size of a cherry, globular, densely covered with long brown rigid but flexible hispid bristles; seeds small, ovate-oblong.

HAB.—Frequent in the tropical and mixed forests all over Burma and the adjacent provinces. Fr. C. S.—s×l.—SS. = SiS., Metam., &c.

4. **B. Andamanensis,** Kz.; H.f. Ind. Fl. i. 377.—A scandent scabrous shrub, the young shoots sparingly and softly puberulous; leaves cordate-ovate, on a glabrous or almost glabrous petiole 3-5 in. long, shortly 3-5-lobed, with the lobes acuminate or acute, rarely almost not lobed, irregularly and coarsely toothed, membranous, while very young softly pubescent, full grown glabrous, and usually a little puberulous along the principal nerves; flowers on slender pedicels, forming bi- to trichotomously branched, slender, minutely puberulous cymes in the axils of the leaves; capsules globose, the size of a cherry, glabrous, covered with unequally long, stiff, quite smooth, straight, sharp bristles.

HAB.—Frequent in the coast-forests of South Andaman; also Upper Tenasserim.—Fr. H.S.

TILIACEÆ.

Flowers regular, hermaphrodite or unisexual. Sepals 3-5, free or united, valvate. Petals as many as sepals, rarely none, imbricate or valvate. Stamens numerous, rarely few and definite, usually arising from a prolonged or dilated torus, free or rarely 5-adelphous; anthers 2-celled. Ovary free, 2-10-celled, each cell with few often pendulous or numerous ovules often placed in two or more series. Fruit fleshy or dry, dehiscent or indehiscent, 2-10 or by abortion fewer- or 1-celled. Seeds 1 or many, ascending, pendulous or transverse, without arillus. Albumen fleshy, abundant, scarce, or rarely none.—Trees, shrubs, or herbs, with alternate, rarely opposite, simple or lobed leaves. Flowers usually cymose.

The juice of all species is more or less mucilaginous. The fibre of many species is very strong and used for cordage, and *Corchorus* yields the famous jute. Some trees yield superior timber. The pyrenes of some *Elæocarps* are made into the so-called brambeads. The drupes of some *Grewias* possess an agreeable acid taste and are used in sherbets, &c. About 50 species are known from Burma, of which the greater part reckon amongst woody plants.

* *Anthers opening by slits.*
○ Sepals united in a bell-shaped 3-5-cleft calyx.
× The 5 inner stamens reduced to staminodes.
Carpels distinct, globular, 2-valved . . . . . *Brownlowia.*

Fruits 3-5-winged, indehiscent, by abortion 1-seeded . . . *Pentace.*
× × Anthers all developed. Capsule 3-4-valved with twice as many wings . . . . . *Berrya.*
○ ○ Sepals distinct. Petals with a more or less adnate basal scale.
Fruit dry, winged . . . . . *Columbia.*
Fruit more or less drupaceous, not winged . . . . . *Grewia.*
∗ ∗ *Anthers opening by apical pores.*
Capsule-woody, 4-valved . . . . . *Echinocarpus.*
Fruit a drupe . . . . . *Elæocarpus.*

BROWNLOWIA, Roxb.

Calyx bell-shaped, irregularly 3-5-cleft. Petals 5, glandless. Stamens many, free, arising from a raised torus. Staminodes 5, opposite to the petals and petaloid. Anthers almost globose. Ovary 5-celled, with a pair of ascending ovules in each cell; styles subulate, slightly cohering. Carpels ultimately free, 2-valved, 1-seeded. Albumen none.—Trees, with stellate or scaly pubescence and simple leaves. Flowers in terminal and axillary panicles.

∗ *Calyx and inflorescence puberulous or pubescent.*
Leaves deeply peltate, oblong or rotundate . . . . . *B. peltata.*
Leaves not peltate, cordate-oblong; calyx 3-3½ lin. long, velvety . *B. elata.*
∗ ∗ *Inflorescence and young shoots silvery or coppery lepidote.*
Leaves lanceolate; calyx 2 lin. long, scaly . . . . . *B. lanceolata.*

1. **B. peltata,** Bth.—A small tree, all younger parts greyish puberulous; leaves peltate, broadly oblong or almost rotundate, on a puberulous petiole, 7-8 in. long shortly cuspidate, 8-10 in. long, entire, usually palmately 9-nerved at base, glabrous above, puberulous and glaucescent beneath, transversely veined and net-veined, not unlike those of *Mappa;* flowers about 4 lin. long, on long shortly and densely puberulous pedicels, forming large and loose greyish puberulous panicles at the end of the branchlets and in the axils of the upper leaves; calyx about 3 lin. long, tawny velvety outside; petals oblique, waved, shortly and abruptly clawed; staminodes narrow linear.

Hab.—Tenasserim.

2. **B. elata,** Roxb.; H.f. Ind. Fl. i. 381.—A large evergreen tree, the trunk measuring, according to Roxburgh, about 15 ft. in girth, the younger parts rusty or tawny puberulous; leaves cordate or cordate-oblong, not peltate, on a puberulous petiole 1½-2½ in. long, 4-12 in. long, acute or shortly acuminate, entire, coriaceous, glossy above, shortly puberulous and somewhat glaucescent beneath; flowers yellow, about 10 lines in diameter, on rather long, scurfy puberulous pedicels, forming large, loose, puberulous panicles at the end of the branchlets and in the axils of the upper leaves; calyx about 3-3½ lin. long, scurfy-tomentose; petals obliquely oblong; staminodes yellow, linear, shorter than the stamens; carpels 1-5,

usually 2 or 3, roundish oval, 1-1½ in. in diameter, woody, 2-valved, ash-grey, minutely puberulous, 1- rarely 2-seeded.

Hab.—Tidal forests of Chittagong and Tenasserim.—l.—SS. =Sal.

3. **B. lanceolata,** Bth.; H.f. Ind. Fl. i. 381.—An evergreen tree (25—35+8—10+2—3), the younger parts rusty or coppery lepidote; leaves lanceolate or oblong-lanceolate, rounded or obtuse at the base, on a lepidote petiole ½ in. long or longer, 3-7 in. long, acuminate, entire, coriaceous, glabrous above, greyish lepidote beneath, while young rusty and metallic-scaly all over; flowers small, hardly 2 lin. long, on rather long lepidote pedicels, forming rather short, rusty or coppery lepidote narrow panicles in the axils of the upper leaves or collected into larger ones at the ends of the branchlets; calyx densely lepidote, hardly 2 lin. long; petals somewhat longer, oblong, slightly narrowed at base; carpels almost globose, rather flat on the inner side, shortly greyish pubescent, about ½ in. in diameter.

Hab.—Rather frequent in the tidal forests and mangrove-swamps of the sea-shores from Arracan down to Tenasserim.—Fl. Febr.-May.—l.—SS.=Sal.

PENTACE, Hassk.

Calyx bell-shaped, irregularly 3-5-cleft. Petals 5. Stamens numerous, inserted on the torus, free or in 5 bundles; staminodes 5, alternating with the staminal bundles; anthers nearly globose. Ovary 5-3-celled, with a pair of ovules in each cell; style subulate. Fruit dry, indehiscent, broadly 5-3-winged, by abortion 1-celled and 1-seeded. Seeds albuminous.—Trees, with entire or slightly sinuate leaves. Flowers small, cymose in terminal panicles.

1. **P. Burmanica,** Kz.; H.f. Ind. Fl. i. 381.—*Thit-ka* or *kathit-ka.*—An evergreen tree (100—120+70—75+5—12), the younger parts pubescent; leaves oblong or ovate-oblong, 4-6 in. long, rounded or obtuse at the 3- or almost 5-nerved base, on a glabrescent petiole ½-¾ in. long, acuminate, entire or slightly sinuate-lobed, chartaceous, glabrous and glossy above, beneath pale and especially along the nerves puberulous; flowers small, on rather long tawny tomentose pedicels, forming short densely tawny tomentose panicles at the ends of the branches; calyx about 2 lin. long, 5-cleft, the lobes lanceolate and rather regular, tomentose outside; petals obovate-oblong, narrowed at the base, somewhat longer than the calyx; stamens in 5 bundles of 4 to 7, the bundles alternating with as many linear-subulate long staminodes; capsules 5-celled and 5-winged, softly and shortly tawny-pubescent, the valves surrounded by a broad longitudinal 1-1½ in. long wing rounded at both ends.

Hab.—Frequent in the tropical forests of the eastern and southern slopes of the Pegu Yomah and from Martaban down to Upper Tenasserim.—Fl. Jan.; Fr. Febr.-March.—s : l.—SS.=*SiS.*, Metam,

Remarks.—Wood rather heavy, coarse-fibrous, but close-grained, white, turning red-brown at exposure, the heart-wood red. Used for boats, &c. Exudes a red resin.

BERRYA, Roxb.

Calyx bell-shaped, irregularly 5-2-lobed or -cleft. Petals 5. Stamens numerous, free; anthers almost globose. Staminodes none. Torus not raised. Ovary 3-celled, with 2 ovules in each cell; style subulate. Capsule nearly globose, loculicidally opening in 2 or 3 valves, each bearing on the back 2 vertical diverging wings. Seeds one or two in each cell. Albumen fleshy.—Trees, with entire or lobed leaves 5-9-nerved at base. Flowers small, in cymes forming panicles.

1. **B. amonilla,** Roxb.; H.f. Ind. Fl. i. 383, var. **mollis,** Wall.; Bedd. Sylv. Madr. t. 58.—*Hpet-woon.*—A leaf-shedding tree (60—70 + 30—35 + 6—7), shedding leaves in HS., all softer parts shortly stellate pubescent; bark thin, longitudinally cracked, rather smooth, brownish-grey; cut dry, brown; leaves broadly cordate-rotundate, 6-7 in. each way, palmately 7-9-nerved at base, on a densely puberulous or pubescent petiole 4 to 5 in. long, rather blunt or acute, obsoletely repand and produced into 2-3 short, blunt, or rarely acute lobes, glabrescent above except on the nerves, beneath shortly and densely pubescent or puberulous; flowers about 4-5 lin. in diameter, white, on long tomentose pedicels, forming loose tawny tomentose panicles at the end of the branches; calyx densely pubescent outside, deeply 2-3-cleft, almost globose in bud; petals obovate-lanceolate, longer than the calyx; stamens very numerous; style simple, glabrous; ovary villous; capsules (including the nerved obliquely oblong wings) about 2-2½ in. across, thinly and shortly pubescent all over, dry, brown; seeds almost globose, hispid.

Hab.—Not unfrequent in the drier upper mixed and hill Eng forests of Martaban and the Pegu Yomah, up to 3,000 ft. elevation.—Fr. March.—l.—SS.=Metam., SiS.

Remarks.—Wood red-brown, much prized for axles, the poles of carts and ploughs, also for spear-handles. □′=56-62 pd.

COLUMBIA, Pers.

Sepals 5, distinct. Petals 5, with a basal scale. Stamens numerous, free, arising from a raised torus. Ovary 5-3-celled, with 2-4 ovules in each cell; style subulate. Capsule roundish, 3-5-winged and-celled, the cocci indehiscent, 1-seeded. Seeds albumin-

ous.—Trees or shrubs, with simple often oblique leaves. Flowers small, clustered, in terminal panicles.

Leaves cordate-oblong; fruits ¾-1 in. in diameter . . . . *C. floribunda.*
Leaves lanceolate; fruits 1½ in. in diameter . . . . . *C. Merguiensis.*

1. **C. floribunda,** Kz.; H.f. Ind. Fl. i. 393.—A meagre shrub, 6 to 10 ft. high, all parts scabrous from short stellate hairs; leaves rotundate or broadly obovate-oblong, usually cordate at the 7-nerved base, on a rather long slender scabrous petiole, acute or shortly acuminate, but more usually blunt, usually produced towards the summit into 1 or 2 short, blunt or truncate or rarely acute lobes, distantly toothed, chartaceous, very scabrous above from minute stellate hairs, beneath similarly more or less puberulous and turning scabrous; flowers small, on slender but short shortly tomentose pedicels arranged in little peduncled cymes and forming terminal, lax, greyish puberulous panicles at the end of the branches or smaller ones in the axils of the uppermost leaves; sepals about a line long, shortly greyish pubescent outside, red inside; petals obovate-oblong, blunt, nearly as long as the sepals, yellow, scarlet-dotted, with a minute, villously fringed, thickened, basal cavity; capsules 7-9 lin. in diameter, scabrously stellate-puberulous, separating into 3 or 4 indehiscent 2-winged 1-seeded carpels.

Hab.—Martaban, in Toukyeghât east of Tounghoo; also Ava.—Fr. Nov.-Jan.

2. **C. Merguiensis,** Planch.; H.f. Ind. Fl. i. 394.—Leaves lanceolate, 6-8 in. long, acuminate, 1-3-nerved, on ½ in. long petiole, serrate, scabrous above, puberulous beneath; capsule ½ in. across, downy, 3-winged. (From Hooker's Fl. Ind.)

Hab.—Tenasserim.

GREWIA, L.

Sepals 5, distinct. Petals 5, with a basal adnate scale, rarely none. Stamens numerous on a raised torus. Staminodes none. Ovary 4-2-celled, with 2 or more ovules in each cell; style subulate. Drupe fleshy or fibrous-fleshy, entire or 2-4-lobed, containing 4-1 one- or two-seeded pyrenes or stones. Albumen fleshy or rarely none.—Trees or shrubs, with simple 1-9-nerved leaves. Flowers usually rather small, axillary and few, or in cymes, or in terminal panicles.

* *Flowers forming terminal panicles, involucred while in bud.*
○ Endocarp of drupes fibrous-woody . . . . *G. calophylla.*
○ ○ Endocarp of drupes crustaceous or bony.
Leaves chartaceous, not sinuate, glabrous, or beneath puberulous; ovary and torus glabrous . . . . . *G. microcos.*
As former, but flowers and leaves much smaller, the latter sinuate-lobed . . . . . *G. sinuata.*
* * *Flowers in axillary or leaf-opposed cymes or clusters.*

○ *Leaves at base 3-nerved, or rarely with an additional lateral nerve.*

Drupes deeply 2-4-lobed from the top (by abortion occasionally 1-lobed).

Cymes and sepals shortly rusty-tomentose; leaves on both surfaces very scabrous from minute stellate hairs; drupes deeply 4-lobed *G. scabrida.*

Cymes sprinkled with stiff hairs, glabrescent; sepals greyish or tawny velvety; leaves glabrous or sparingly short-hairy, rarely puberulous beneath . . . . . *G. lævigata.*

× × Drupes entire, or only slightly lobed.

Leaves beneath and young parts greyish velvety; drupes globular, grey-pubescent . . . . . *G. excelsa.*

Leaves at base 3- or 4-nerved; cymes rather long-peduncled; drupes obsoletely 4-lobed, red, sparingly hirsute . . . . *G. hirsuta.*

As former, but more densely pubescent or tomentose . . . *G. humilis.*

Leaves at base 3- or 4-nerved, scabrous; flowers in short, dense, sessile clusters; stamens 16 . . . . . *G. microstemma.*

○ ○ *Leaves usually broad, 5-7-nerved at base, the upper ones often only 3-nerved, or 3- and 5-nerved ones intermixed.*

× Peduncle slender, much longer than the petioles.

Leaves obliquely-lanceolate, especially while young greyish or whitish tomentose beneath . . . . . *G. elastica.*

Leaves broadly obovate or almost rotundate, sparingly stellate-pubescent, or pubescent beneath, often scabrous . . . *G. asiatica.*

× × Peduncles very short or almost reduced, and the flowers appearing clustered.

Leaves very variable, tomentose to pubescent; drupes from the top 4- or by abortion fewer-lobed . . . . . *G. abutilifolia.*

Leaves very scabrous and harsh; drupes the size of a cherry, almost globose . . . . . *G. sclerophylla.*

∗ *Flowers involucred while in bud, forming terminal panicles.*

1. **G. calophylla,** Kz.; H.f. Ind. Fl. i. 392.—An evergreen tree (20—30 + 8—15 + 2—2½), all parts glabrous, the leaf-buds tawny velvety; leaves oblong or oblong-lanceolate, 4-7 in. long, on a glabrous or slightly puberulous longer or shorter petiole, often unequal at the rounded or acute strongly 3-nerved base, acuminate, entire, chartaceous or almost coriaceous, glabrous, glossy, the nerves purplish; stipules linear, glabrous; flowers nearly ½ in. long, cream-coloured, on very short puberous pedicels, while in bud enveloped in the coriaceous velvety bractlets, forming a velvety terminal panicle; petals about 2 lin. long, the blade narrow linear, acuminate, somewhat longer than the oblong thick foveolate scale which is densely villous outside and along the borders; ovary and gynophore velvety or densely villous; drupes obovate, about 1½ in. long, smooth, red; the endocarp fibrous.

Hab.—Not uncommon in the tropical coast-forests of South Andamans.—Fl. May-June—s.—SS.=SiS.

Remarks.—Wood yellowish-grey, with a darker-coloured heart-wood, rather coarsely fibrous, light.

2. **G. microcos,** L.; H.f. Ind. Fl. i. 392.—*Myat-ya.*—Very variable in size, usually a tree of 40 to 50 ft. high, with a trunk

10-25 ft. long and a girth of 4-5 ft., but occurring also as a small shrub of only a few feet, the young shoots slightly pubescent; bark about ¼ in. thick, brown, rather even, but rough, peeling off in very small convex pieces; leaves obovate-oblong, broadly oblong or oblong, on a rather short hirsute petiole, usually unequal at the rounded or obtuse 3-nerved base, 4 to 6 in. long, acuminate, crenate-toothed or serrate, chartaceous, thinly and elegantly nerved, sprinkled with short hairs along the principal nerves beneath; stipules falcate-lanceolate, puberulous, simple, those towards the inflorescences often 2-cleft; flowers small, yellowish-white, while in bud usually by 2 or 3 clustered and concealed by the lanceolate coherent puberulous bractlets, the clusters peduncled and collected into terminal, hairy, and often puberulous panicles; sepals obovate-lanceolate, densely puberulous, waved; petals about a line long, the blade shortly 2- or 3-lobed and longer than the foveolate base, which is villous along the margins and outside; ovary and the short gynophore glabrous; drupes oval, the size of a pea, blackish, glabrous, containing a bony 3-6-celled stone.

Hab.—Frequent all over Burma from Chittagong and Ava down to Tenasserim, in the mixed forests, especially the lower ones.—Fl. Apr.-June.—s × l.—SS. = ∞ *Lat. p.*

Remarks.—Wood not used. □′ = 51 pd.

3. **G. sinuata,** Wall.; H.f. Ind. Fl. i. 392.—A branched large shrub, 5 to 10 ft. high, the young parts puberulous; stipules linear, shorter than the petioles; leaves variable, 1½-2½ in. long, oblong to obovate-oblong, irregularly and more or less deeply sinuate-lobed, cordate at the 3-nerved base, on a pubescent petiole a line long, blunt or bluntish, chartaceous, above glabrous or nearly so, beneath sprinkled with minute stellate hairs; flowers small, yellowish, while in bud clustered and involucred by the obovate coriaceous tawny puberulous bractlets, afterwards forming a short small short-peduncled tawny pubescent panicle at the end of the branchlets; sepals 3-4 lin. long, concave, cuneate-lanceolate, pubescent; petals a line long, narrow, with a villous basal appendage; ovary and torus glabrous; unripe drupes obovate, glabrous.

Hab.—Frequent in the swamp-forests of the alluvial plains in Pegu and Martaban; also Tenasserim.—Fl. May.

* * *Flowers in axillary or leaf-opposed cymes or clusters.*

4. **G. scabrida,** Wall.; H.f. Ind. Fl. i. 389.—An evergreen shrub, all softer parts shortly rusty-tomentose; leaves oblong or ovate-lanceolate, 5-6 in. long, on a short rusty-tomentose petiole, obtuse or rounded at the 3-nerved base, serrate, acuminate, chartaceous, on both sides (more so beneath) scabrous from short stellate hairs, the transverse nerves very conspicuous; flowers about 8 to

10 lin. long, on furrowed, rusty and somewhat scurfy tomentose pedicels, forming usually 2-3 to few-flowered rusty-tomentose cymes in the axils of the leaves; sepals about 7-8 lin. long, linear-lanceolate, scabrously and shortly rusty-tomentose outside; petals about 2 lin. long, the blade oblong-lanceolate, blunt, separable from the thick broad densely tawny villous basal scale; gynophore and ovary tawny villous; drupes deeply 4-, or by abortion fewer-lobed, nearly an in. across, the lobes obtuse and spreading, somewhat hairy and more or less glabrescent, the mesocarp fibrous, each of the 4 stones containing a single seed.

Hab.—Tenasserim.—Fl. Sept.; Fr. Febr.

5. **G. lævigata,** Vhl.; H.f. Ind. Fl. i. 389; Bedd. Sylv. Madr. 37; Brand. For. Fl. 42.—An evergreen tree (20—30 + 6—10 + 1—1½), the young parts pubescent or almost glabrous; bark 3 lin. thick, greenish dark-grey, marked with longitudinal ash-grey stripes; cut dry, whitish; leaves oblong-lanceolate or lanceolate, at both ends acuminate, 3-nerved, on a short but slender petiole, serrate or serrulate, membranous, usually 4-6 in. long, glabrescent or glabrous above, beneath slightly or rarely densely downy; flowers whitish, on slender sparingly pubescent or glabrous pedicels, forming poor, shorter or longer peduncled, more or less glabrous cymes in the axils of the leaves; sepals 6-7 lin. long, velvety-tomentose outside; petals about a line long or a little longer, the blade oblong-lanceolate, acute, as long or shorter than the villously bordered thick broad basal scale; ovary appressed hispid; drupes almost to the base 2-parted, the lobes 2-lobed, black when ripe, glabrous, each of the size of a pea, and containing a 1- or 2-seeded stone.

Hab.—Not uncommon in the upper mixed forests all over Pegu and adjacent provinces down to Tenasserim.—Fl. Sept.-Oct.; Fr. March-Apr.—s.— SS. = SiS. All.

Remarks.—Wood rather heavy, fibrous, but close-grained, soft, white, turning yellowish, then brownish.

6. **G. hirsuta,** Vhl.; H.f. Ind. Fl. i. 391.—*Kyek-ta-yaw.*—An erect shrub, 3 to 5 ft. high, usually scabrously hirsute, but the vestiture varying greatly, becoming tomentose in varieties; leaves ovate-lanceolate or lanceolate, occasionally somewhat oblique, very shortly petioled, acuminate, 1½-3 or 4 to 5 in. long, unequally serrate, slightly wrinkled and scabrous above, beneath pubescent or softly tomentose, or on both sides tomentose; peduncles short, thick, solitary, or by 2 or 3 in the axils of the leaves, 2-4-flowered; flowers small, white, turning yellow; sepals about 3 lin. long, lanceolate, tomentose outside; petals half as long, oblong, blunt, glabrous outside, half the length of the thick villously-bordered

basal scale; torus short and thick; ovary villous; stigmas 2-3, spreading, stigmatose-fringed; drupes almost globular, obsoletely 4-lobed, as large as a pea, red-brown, hirsute, containing four 2-celled stones.

HAB.—Frequent all over Burma in the mixed forests, especially in the upper ones.—Fl. H. and R.S.; Fr. C.S.—s×l. —SS. = ∞ *SiS. All.*

H. excelsa, Vhl.; H.f. Ind. Fl. i. 385.—A shrub, greyish velvety all over, with globular greyish velvety drupes; is said to grow in Chittagong.

7. **G. humilis,** Wall.; H.f. Ind. Fl. i. 390.—Very much like the preceding species, but the leaves broader and shorter, and in varieties even retuse, the tomentum more villous or velvety. Probably but an extreme form of the former.

HAB.—Not unfrequent in the savannahs, especially along the borders of the swamp-forests of the Irrawaddi-alluvium of Pegu; also Ava.—Fr. C.S.

8. **G. microstemma,** Wall.; H.f. Ind. Fl. i. 390.—A shrub, all softer parts scabrously puberulous; leaves oblong or ovate-lanceolate, unequally rounded at base, 3-nerved, with an additional nerve at the broader base, on a very strong tawny tomentose petiole, 5-7 in. long, acuminate, doubled serrate-toothed, chartaceous, on both sides, but especially beneath, scabrously puberulous; stipules longer than the petiole, subulate, stiff, scabrously puberulous; flowers small, on short tomentose pedicels, forming very short peduncled dense cymes, usually by 2 or 3 in the axils of the leaves; sepals about 2 lin. long, tawny puberulous; petals linear-lanceolate, a line long, on the back with a line of hairs, as long as the oval villously fringed thickened basal scale; stamens in male flowers 16; ovary hirsute; drupes almost globular, 4-1-lobed, the size of a large pea, glabrescent.

HAB.—Ava and Prome hills.—Fl. Sept.-October.

9. **G. elastica,** Royle. (*G. vestita,* Wall.; Brand. For. Fl. 40).—*Pintayo* or *Pengtarow.*—A tree (25—30+8—15+2—3), shedding leaves in the HS., all softer parts greyish velvety or shortly tomentose; bark thick, wrinkled, and knobby; leaves obliquely oblong-or ovate-lanceolate, 5-7-nerved, on short tomentose glabrescent petioles, 4-5 in. long or longer, shortly acuminate, chartaceous, serrulate, while young puberulous or shortly pubescent above and glabrescent, beneath greyish or whitish velvety or closely pubescent, and more or less glabrescent on the principal black nerves; flowers rather small, on tomentose pedicels, forming several short 2-3-flowered tomentose or velvety cymes in the axils of the leaves; sepals whitish velvety or tomentose outside, about 3 lin. long; petals about a line long or shorter, linear-lanceolate, hardly thickened at base and a little puberulous; ovary villous; drupes oval, the size of a small pea, containing two 1-seeded stones.

HAB.—Frequent in the upper mixed forests of the Pegu Yomah and Martaban; also Chittagong.—Fl. Nov.-Decb.—l.—SS.=SiS. Metam.

10. **G. Asiatica,** L.; H.f. Ind. Fl. i. 386; Bedd. Sylv. Madr. 37; Brand. For. Fl. 40.—A small leaf-shedding tree or (in Burma) remaining a shrub hardly 2 to 4 ft. high, all softer parts softly pubescent; leaves rotundate, sometimes obliquely and broadly ovate-rotundate, on a rather short tomentose petiole, rounded or obtuse at the 5-7-nerved base, acute, sometimes obsoletely lobed and almost blunt, unequally crenate-serrate, chartaceous, when full-grown on both sides rough from minute stellate hairs; flowers nearly 4 lin. long, on slender puberulous pedicels, forming 3-7 slender slightly woolly or tomentose cymes in the axils of the leaves; sepals softly tomentose outside, yellow inside; petals nearly 2 lin. long, reddish, oblong, blunt or somewhat acute, the blade twice or nearly 3 times longer than the foveolate, villously fringed, thickened basal scale; filaments red; ovary densely villous; drupes the size and shape of a pea, or slightly 2-lobed, reddish, glabrescent, containing 1 or 2 one-seeded stones.

HAB.—Only the stunted shrubby variety seems to grow in Burma (probably Ava).

11. **G. tiliæfolia,** Vhl.; H.f. Ind. Fl. i. 386; Bedd. Sylv. Madr. t. 108; Brand. For. Fl. 41.—A middling-sized tree, the young shoots minutely pubescent; leaves slightly oblique, more or less ovate or almost rotundate, on a glabrescent petiole ½ to 1 in. long, cordate or rounded at the 5-6-nerved base, crenate-toothed, rounded or blunt, chartaceous, 2-4 in. long, sparingly minutely stellate-hairy, glabrescent above; flowers small, yellow, on 2-3 lin. long puberulous pedicels, by 2-3 on a ¼-½ in. long peduncle and forming several puberulous small cymes in the axils of the leaves; sepals 3-3½ lin. long, tawny-velvety outside; petals linear-oblong, about a line long, much longer than the villously fringed foveolate basal scale; torus glabrous; ovary tawny hirsute; drupes glabrescent, bluish-black, usually 2-lobed, the lobes as large as a pepper-kernel, the stones 3-6-celled.

HAB.—Ava.

12. **G. abutilifolia,** Juss.; H.f. Ind. Fl. i. 390; Bedd. Sylv. Madr. 37.—*Sin-ma-no-pyin.*—A shrub, often only 2-3 ft. high, the younger parts densely rusty-tomentose; leaves rotundate or broadly ovate, on a rather short rusty-tomentose petiole, very variable in size, in sunny situations 1-3, in shady ones 6-10 in. long, obtuse or rounded at the 3-5-nerved base, often shortly lobed, acute or almost blunt, irregularly toothed and serrate (the younger leaves bristly serrate), membranous, shortly hirsute or tomentose; flowers nearly 6 lin. long or smaller, on short tomentose pedicels, greenish-

white, forming dense, short clusters or very short peduncled cluster-like tomentose cymes in the axils of the leaves; bracts much shorter than the flower-buds, oblong, acute, blackish when dried, appressed hirsute outside, or linear-lanceolate and longer than the buds; sepals densely rusty pubescent or appressed tawny hispid; petals about ½ lin. long, oblong, blunt, the blade nearly as long as the villously fringed thickened basal scale; ovary hirsute; drupes the size of a large pea, sparingly hirsute, soon glabrescent, deeply 4-lobed from the top and 4-pyrenous, the lobes almost spreading, the stones 1-seeded. A very variable shrub as to indument and texture of leaves, etc.

Hab.—Not unfrequent in the upper mixed forests of the Pegu Yomah and in the open (specially the low and Eng forests) of Pegu, Prome and Martaban.—Fl. May.—l.—SS.=SiS., Lat., Arg.

G. Sclerophylla, Wall. (Brand. For. Fl. 39.)—With still larger flowers and almost globular entire drupes of the size of a cherry, is said to occur in Ava and Chittagong.

ECHINOCARPUS, Bl.

Sepals 4-5, imbricate. Petals 4-5, variously cut. Stamens numerous, free, arising from a thick disk; anther-cells opening by a terminal pore. Ovary 3-6-celled, with many ovules in each cell; style subulate. Capsule woody or coriaceous, 3-6- or by abortion fewer-celled. Albumen fleshy.—Trees with simple leaves. Flowers solitary or clustered in the axils of the leaves.

Leaves entire, tufted-hairy in the nerve-axils beneath; prickles of capsule strong, usually thickened at base . . . . *E. Sigun.*

Leaves crenate-serrate or toothed, at least when young puberulous beneath, the prickles longer, all thin and subulate . . . *E. sterculiaceus.*

1. **E. Sigun,** Bl. (*E. murex,* Bth.; H.f. Ind. Fl. i. 399.)—A large tree, all parts glabrous or nearly so; leaves elliptically oblong to oblong-lanceolate, 3-5 in. long, on a long glabrous petiole, rounded to acute at base, usually quite entire or obsoletely crenate-toothed, acuminate, chartaceous, glabrous, and usually with a tuft of hairs in the nerve-axils beneath; flowers solitary, on rather long axillary peduncles; petals 4-5, ovate, 3-cleft at summit; filaments tomentose; anthers puberulous; capsules ovoid-globular, shortly tomentose between the prickles, woody, densely or laxly covered with 5 to 6 lin. long, rigid, minutely hispid prickles arising from a thickened base and terminating in a rather bluntish point.

Hab.—Tenasserim hills.—Fr. Apr.

2. **E. sterculiaceus,** Bth.; H.f. Ind. Fl. i. 400.—A large tree, the young shoots puberulous; leaves oblong, on an ½-1½ in. long

petiole, obtuse at base, apiculate, 5-10 in. long, chartaceous, crenate-toothed, glabrous above, puberulous beneath; flowers solitary or several together from above the scars of the fallen leaves; peduncle 1-1½ in. long, shortly tawny-tomentose; ovary tawny velvety and prickly; capsules 5-6-celled, the size of a wood-apple or larger, densely covered with straight, subulate, minutely hispid, sharp spines of ⅔ to an inch length.

HAB.—Not unfrequent in the drier hill-forests of Martaban and Upper Tenasserim, at 3,000 to 5,000 ft. elevation.—l.—SS. = Metam.

ELÆOCARPUS, L.

Sepals 5, usually valvate. Petals as many, fringed or lobed, rarely entire, inserted round the base of the cushion-like often 5-lobed torus. Stamens more than 10 and often very numerous, inserted inside of the torus; anther-cells opening by a terminal pore. Ovary 5-2-celled, with 2 or more ovules in each cell; style subulate. Fruit a drupe, containing a bony or hard 2-5- or by abortion 1-seeded putamen. Albumen fleshy.—Trees with simple alternate or rarely opposite leaves. Flowers usually hermaphrodite in axillary racemes.

* *Anthers cuspidate or aristate. Flowers usually large, the petals usually silk-hairy, fringed, or very rarely entire or nearly so.*

× *Petals entire, with a few short teeth at apex or simply fringed, not cut or cleft. Petioles continuous, not incrassate-geniculate.*

○ Inflorescence and sepals outside almost glabrous . *E. petiolatus.*

○○ Inflorescence and sepals outside silky-pubescent.

Glabrous; petals entire, acuminate; pedicels ⅔-¾ in. long . . *E. Griffithii.*

Glabrous; petals deeply but simply fringed; pedicels 3-4 lin. long *E. Varunua.*

×× *Petals 2-3-cleft, the lobes jagged or fringed; anthers glabrous or puberulous.*

○ Petiole geniculate-thickened at the apex.

† Inflorescence with leafy bracts, glabrous . . *E. bracteatus.*

†† Bracts of inflorescence small, deciduous before flowering.

△ Racemes and sepals glabrous or nearly so . *E. simplex.*

△△ Racemes and sepals more or less tomentose or pubescent.

Leaves 1-1½ ft. long, cuneate-acuminate at base, acute; anthers shorter than the bristle; drupes puberulous, the putamen slightly compressed . . . . . *E. grandifolius.*

Leaves ½-1 ft. long, rounded at the narrowed base; leaves glabrous or nearly so; putamen terete . . . . . *E. rugosus.*

○○ Petiole continuous, not geniculate-thickened at apex.

Putamen long-recurved-aculeate . . . . . *E. grandiflorus.*

Putamen lacunose-tubercled; leaves blunt, very thick coriaceous . *E. littoralis.*

** *Anthers blunt, or the longer valve shortly produced; flowers small; petals glabrous.*

× *Putamen even and usually slightly rimose or obsoletely wrinkled.*

○ Petiole geniculate-thickened. Leaves pustulate, opaque . . . . . *E. floribundus.*

○○ Petiole not geniculate-thickened.

Leaves glabrous, opaque, acuminate . . . . . *E. lanceæfolius.*

Leaves glossy above, blunt or rounded at apex . . . . *E. hygrophilus.*

×× *Putamen wrinkled or tubercled. Calyx and pedicels puberulous.*

○ Petiole not geniculate-thickened at apex.

Leaves and petiole glabrous; style long, exserted, the longer anther-cells acute; drupes globular . . . . . *E. Ganitrus.*

Leaves beneath along the nerves and the short petioles densely puberulous; style short; anther-cells equal, blunt; drupes oblong . . . . . *E. lacunosus.*

○○ Petiole thickened at the apex.

Leaves beneath and the rather short petioles densely puberulous . *E. Wallichii.*

Leaves and the long petioles glabrous; drupes oblong . . . *E. robustus.*

All parts densely and shortly pubescent; drupe globular . . *E. stipularis.*

* *Anthers cuspidate or aristate. Flowers usually rather large, the petals silk-hairy, fringed or very rarely entire.*

1. **E. petiolatus,** Kz. (*E. integra,* Wall.; H.f. Ind. Fl. i. 408).—An evergreen tree, all parts glabrous; leaves elliptical to elliptically oblong, on a geniculate, smooth petiole 1½-2½ in. long, obtuse or acute at base, bluntish acuminate or apiculate, 4-6 in. long, chartaceous, glabrous, gland-bearing in the nerve-axils beneath; flowers middling-sized, on ½ in. long minutely puberulous pedicels, forming an almost glabrous raceme in the axils of the leaves; sepals linear-lanceolate, acuminate, almost glabrous, with a puberulous margin; petals thick, oblong-lanceolate, densely silky villous all over, acuminate, with short capillary fringes at the upper part; ovary quite glabrous; anthers glabrous; drupes oblong, about ½ in. long, smooth and glossy; putamen fibrous-woody, even, 1-celled by abortion.

Hab.—Tenasserim.

2. **E. Griffithii,** Kz.; H.f. Ind. Fl. i. 408.—A small evergreen tree, all parts glabrous; leaves from oblong and oblong-lanceolate to broadly lanceolate, on a glabrous geniculate petiole ½ to 2 in. long, obtuse or rarely rounded at base, 4 to 4½ in. long, bluntish acuminate or almost caudate, obsoletely crenate-toothed, chartaceous, glabrous; flowers white, on ⅔-¾ in. long silky pubescent pedicels, forming axillary more or less silky pubescent racemes longer than the leaves and often crowded at the end of the branchlets; sepals lanceolate, acuminate, about 4 lin. long, shortly but densely silvery silky outside; petals as long as the sepals, but broader, coriaceous, oblong, entire or terminated by 2 or 3 minute teeth, silky outside, silky villous inside; anthers pilose; ovary silky pilose, glabrescent; drupes oblong, smooth and glossy; putamen by abortion 1-celled.

Hab.—Tenasserim.—Fl. Decb.-Jan.

3. **E. Varunua,** Ham.; H.f. Ind. Fl. i. 407.—An evergreen tree, the young shoots silky pubescent; leaves oblong to elliptically oblong, on a glabrescent geniculate petiole 1-2 in. long, obtuse or acute at base, shortly and bluntish acuminate, 4-6 in. long, chartaceous, repand-toothed, glabrous; flowers middling-sized, on 3-4 lin. long silky pubescent rather strong pedicels, forming silky pubescent glabrescent racemes in the axils of the leaves and shorter than them; sepals 3 lin. long or a little longer, linear-lanceolate, acuminate, silky pubescent outside; petals nearly as long, oblong, entire, from the middle simply fringed, silky pubescent; anthers glabrous; ovary silky-villous; drupes ovoid-oblong, about ½ in. long, smooth and glossy; the putamen even, by abortion 1-seeded.

Hab.—Chittagong.—Fl. March.

4. **E. bracteatus,** Kz.; H.f. Ind. Fl. i. 406.—An evergreen large tree, all parts glabrous, the leaf-buds slightly silky puberulous; leaves obovate-oblong or obovate, narrowed towards the acuminate base, 5-6 in. long, on a glabrous petiole ½-1 in. long, blunt or bluntish apiculate, repand-toothed, thinly coriaceous, quite glabrous; flowers rather large, white, on an in. long glabrous pedicels, forming quite glabrous leafy-bracted axillary racemes much shorter than the leaves; bracts obovate, sessile, glabrous, serrate-toothed, ⅓-1 in. long, persistent during flowering; sepals 6-7 lin. long, linear-lanceolate, acuminate, glabrous, velvety along the revolute margins; petals a little longer, cuneate-oblong, 2-cleft, the lobes cut and deeply divided into numerous subulate fringes, sparingly silky pubescent outside and inside along the revolute margins; ovary silky-villous; drupes oblong, the size of a plum, smooth; the putamen pitted and tubercled-wrinkled.

Hab.—Tensaserim and Martaban, in the tropical forests.—Fl. March-Apr.

5. **E. simplex,** Kz.—An evergreen glabrous tree, the leaf-buds sparingly silky puberulous; leaves oblong or oblong-lanceolate, on a glabrous, geniculate-thickened petiole an in. long, obtuse at base, 5-6 in. long, blunt or bluntish acuminate, chartaceous, crenate-toothed, glabrous; flowers rather large, on an in. long or longer glabrous pedicels, forming lax glabrous axillary bractless racemes shorter than the leaves; sepals about 6 lin. long, linear-lanceolate, acuminate, glabrous, velvety along the narrow margin inside; petals as long as the sepals, broadly cuneate, usually 2-cleft, the lobes cut and deeply fringed, sparingly silky pubescent outside, silky-villous inside towards the base; anthers glabrous; ovary silvery-tomentose; drupes unknown.

Hab.—Tenasserim.

6. **E. grandifolius,** Kz.—An evergreen tree (30—50+10—20+4—5), the younger parts rusty or tawny tomentose; bark thin,

grey, minutely pustulate; leaves very large, 1-1½ ft. long, obovate-oblong to obovate, cuneately narrowed towards the acute or acuminate base, on a very thick tomentose geniculate-thickened petiole 4-6 lin. long, minutely and remotely serrate-toothed, glabrescent above, beneath, especially along the nerves, shortly puberulous; flowers rather large, on ½-1 in. long tawny tomentose pedicels, forming tawny or rusty-tomentose axillary racemes much shorter than the leaves; sepals about ½ in. long, linear-lanceolate, rusty-tomentose; petals somewhat longer, appressed rusty pubescent outside, 2-cleft, the lobes jagged; anthers the length of the bristle; ovary densely villous; drupes oblong, the size of a plum, tawny-puberulous, the putamen deeply lacunose-wrinkled, bony, somewhat compressed.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban down to Tenasserim.—Fr. Febr.-March.—s.—SS.= *Metam.* SiS.

Remarks.—Wood white, soft.

7. **E. rugosus**, Roxb.; H.f. Ind. Fl. i. 405.—An evergreen tree (60—80 + 10—25 + 6—8), the young shoots tawny villous; bark 2-3 lin. thick, grey, rather smooth, transversely striate; cut greenish pale-coloured, leaves obovate-oblong to obovate, narrowed towards the rounded or obtuse base, on a glabrous geniculate petiole ½-1½ in. long, acute or apiculate, ½-1 ft. long, obsoletely and remotely crenate-toothed, firmly membranous, glabrous, or slightly pubescent along the nerves beneath; flowers white, rather large, on an inch long tawny pubescent pedicels, forming axillary tawny pubescent glabrescent racemes shorter than the leaves; sepals 6-7 lin. long, linear-lanceolate, tawny pubescent; petals as long, cuneate-oblong, usually 2-3-cleft, the lobes irregularly and deeply cut into numerous filiform segments, tawny pubescent outside and inside at base and along the narrow margins; ovary villous; drupe obovoid-oblong, the size of a small pullet's egg, smooth, of an olive yellow; putamen oblong, strongly wrinkled, 1-2-celled.

Hab.—Frequent in the tropical forests, especially along the choungs of the eastern slopes of the Pegu Yomah and Martaban.—Fl. March-Apr.—s.—SS.= SiS. Metam.

Remarks.—Wood rather light, close-grained, soft, whitish, turning yellowish-white, very perishable.

8. **E. grandiflorus**, Sm.—An evergreen tree (30—40 + 10—20 + 4—5), all parts quite glabrous, the buds usually resinous; bark about ⅓ in. thick, grey, rough; cut rather dry, brownish; leaves linear-lanceolate or lanceolate, at base narrowed into the 4 to 5 lin. long glabrous not jointed petiole, bluntish acuminate, repand-toothed upwards, thin coriaceous, glabrous; flowers rather large, on about an inch long glabrous pedicels, forming loose, glabrous, axillary racemes somewhat shorter than the leaves; sepals about 7 lin. long,

lanceolate, acuminate, glabrous, along the inner margins velvety; petals somewhat longer, broadly cuneate-oblong, 3-5-cleft, the lobes cut and deeply fringed, silky puberulous outside and inside at base and along the revolute margins; anthers glabrous; ovary silky-pubescent; drupes elliptically oblong, acuminate, 1-1¼ in. long, smooth; the putamen spindle-shaped, armed with rather long, woody reflexed spines.

Hab.—Martaban, not rare along the banks of rivers in Toukyeghât District.—s.—SS. = Metam.

Remarks.—Wood white, soft.

9. **E. littoralis,** T. et B. —A middling-sized evergreen tree, all parts glabrous; leaves obovate-oblong, narrowed into a slender ½-1 in. long continuous petiole, 3-5 in. long, shallowly repand-serrate, blunt, coriaceous, glossy above, glabrous; flowers rather large, on an inch long slightly puberous pedicels, forming minutely puberous axillary racemes somewhat shorter than the leaves; sepals linear-lanceolate, 6-7 lin. long, greyish velvety; petals as long, cuneate-oblong, silky pubescent on the back outside, cut and fringed; anthers puberulous; ovary tawny villous; drupes about an inch long, oblong, smooth; the putamen deeply lacunose-tubercled, slightly compressed.

Hab.—Tenasserim.—Fl. Febr.

* * *Anthers blunt, or the longer valve shortly produced; petals glabrous.*

10. **E. floribundus,** Bl.; H.f. Ind. Fl. i. 401.—An evergreen tree (30—40+10—15+3—5), the young shoots silky puberulous; leaves oblong or oblong-lanceolate, acute at base, on a glabrous geniculate-thickened petiole 1½-2 in. long, 4-5 in. long, acuminate or acute, chartaceous, coarsely repand-toothed, glabrous, when dried opaque and peculiarly blistery; flowers small, white, on 2-3 lin. long puberulous glabrescent pedicels, forming glabrous axillary racemes as long or often longer than the leaves; sepals 3 lin. long, lanceolate, acuminate, usually puberulous at base and inside along the margins, when dried blistery-opaque; petals as long, broadly oblong-cuneate, cut and fringed to nearly one-half, glabrous, anthers short, terminated by a few hairs; ovary silky tomentose; drupes the size and shape of an olive, smooth; the nut woody; oblong, with 3 longitudinal sutures, slightly rimose, 3-celled.

Hab.—Frequent in the tropical forests, along choungs, of the Martaban hills east of Tounghoo down to Tenasserim, up to 3,000 ft. elevation; also Chittagong. —Fl. Apr.—s.—SS.= Metam.

11. **E. lanceæfolius,** Roxb.; H.f. Ind. Fl. i. 402.—An evergreen tree, the young shoots silky; leaves lanceolate to broadly

lanceolate, at both ends acuminate, on a $\frac{1}{3}$-$\frac{1}{2}$ in. long continuous petiole, crenate-serrate, $2\frac{1}{2}$-$3\frac{1}{2}$ in. long, almost membranous, opaque, or nearly so, glabrous; flowers small, white, on 2-3 lin. long, slender, puberulous pedicels, forming slender, puberulous, glabrescent racemes in the axils of the leaves or above the scars of the fallen ones and shorter than them; sepals $2\frac{1}{2}$ lin. long, lanceolate, acuminate, glabrous outside, puberulous inside; petals a little longer, fringed to more than to one-half of the length; anthers almost glabrous; ovary villous; drupes the size of a pigeon's egg, ovoid-oblong; the putamen 1-celled.

Hab.—Tenasserim.

12. **E. hygrophilus,** Kz.—An evergreen tree (25—30+6—10+2—4), the leaf-buds silvery silky; leaves obovate to cuneate-oblong, on a glabrous geniculate-incrassate petiole $\frac{1}{4}$ to $\frac{1}{2}$ in. long, narrowed at base, 2-3 in. long, blunt or rounded, crenate-serrate, chartaceous, glabrous, more or less glossy above; flowers small, on $2\frac{1}{2}$-3 lin. long, slightly silvery silky pedicels, forming slender, silvery silky glabrescent axillary racemes of the length of the leaves or shorter; sepals 3 lin. long, lanceolate, acute, silky pubescent, glabrescent, velvety along the inner margin; petals a little longer, broadly cuneate fringed to $\frac{1}{2}$ of their length, glabrous; anthers minutely puberulous; ovary silky tomentose; drupes unknown.

Hab.—Frequent in the swamp-forests of the alluvial plains of Pegu and Martaban; also Upper Tenasserim.—Fl. Jan.-March.—s.—SS. = All.

13. **E. Ganitrus,** Roxb.; H.f. Ind. Fl. i. 400; Bedd. Sylv. Madr. 38; Brand. For. Fl. 43.—A large tree, the young shoots silky puberulous; leaves oblong to oblong-lanceolate, about 5-6 in. long, obtuse at base or narrowed into a short 5-6 lin. long glabrous petiole, acuminate or acute, serrulate, almost membranous, glabrous; flowers rather small, white, on slender 2-3 lin. long slightly silk-hairy pedicels, forming numerous silky puberulous rather dense racemes arising from the axils of the leaves or from above the scars of the fallen ones; sepals $2\frac{1}{2}$-3 lin. long, linear-lanceolate, acuminate, slightly and shortly silk-hairy, velvety along the margins inside; petals somewhat longer, cuneate-oblong, usually 3-cleft and deeply cut and fringed, glabrous, tomentose-bordered towards the base outside; anthers minutely hispid, the cells unequal, the longer acute and bearing 2 short rigid hairs; ovary furrowed, silky-villous; drupes globose, the size of a large cherry, smooth, of a deep bluish purple; the putamen spherical, elegantly tubercled, and marked with 5 equidistant, deep, longitudinal furrows.

Hab.—Chittagong.

14. **E. lacunosus,** Wall.—*Bootalet.*—An evergreen tree (40—50+10—20+3—4), the trunk usually crooked, the younger shoots

shortly silk-hairy; bark somewhat roughish, striate, dark-grey; cut dry, brown; leaves obovate-oblong or oblong, obtuse or acute at base, 5-6 in. long, on a puberulous, continuous petiole 4-6 lin. long, acute or shortly acuminate, obsoletely and remotely repand-toothed, above glabrous or slightly puberulous along the midrib, beneath puberulous along the nerves and more or less glabrescent; flowers small, on 2 to 3 lin. long silky-puberulous pedicels, forming densely silky puberulous axillary racemes nearly as long as the leaves; sepals oblong-lanceolate, acute, densely silky pubescent outside and inside along the keel, 2-2½ lin. long; petals a little longer, cuneate-oblong, deeply fringed, glabrous; anther-cells glabrous, somewhat unequal, the longer one blunt and terminated by 2 white short stiff hairs; ovary and style silky-villous; drupes the size and shape of a plum, or smaller and nearly globose; the putamen coarsely tubercled-wrinkled and pitted, 1-celled.

Hab.—Not unfrequent along choungs in the tropical forests and moister upper mixed forests of Pegu and Martaban down to Tenasserim.—Fl. May.-Jul.; Fr. March-Apr.—s.—SS. = SiS., Metam.

15. **E. Wallichii,** Kz.—An evergreen tree (60—70+30—38+3—6), the branchlets and all softer parts tawny puberulous; bark about ⅓ in. thick, greyish-brown, rather smooth; leaves elliptical and elliptically-lanceolate to elongate-oblong, 5-9 in. long, on a geniculate-thickened densely puberulous petiole ½-1½ in. long, rounded at base, acuminate, membranous, remotely and minutely serrate, especially beneath puberulous, above glabrescent; flowers rather small, on thick 3-4-lin. long pedicels, forming velvety tomentose elongate racemes above the scars of the fallen leaves; sepals (in bud) lanceolate, acute, velvety, 2 lin. long; petals glabrous, deeply cleft and long-fringed; anthers obtuse, bearded; ovary villose; fruits unknown.

Hab.—Not unfrequent in the Eng and low forests from Martaban (Toukyeghât) down to Upper Tenasserim; also along the base of the Pegu Yomah; Ava.—SS.= *Metam.*, Lat., SiS.

Remarks.—Wood red.

16. **E. robustus,** Roxb.; H.f. Ind. Fl. i. 402.—An evergreen tree (20—30+8—12+1—2½), the shoots silky-pubescent; leaves ovate-oblong to ovate-lanceolate, rounded at base, on an 1½-1 in. long glabrescent petiole geniculate-thickened at the apex, 5-7 in. long, shortly and bluntish acuminate, repand-toothed, chartaceous, glabrous, or while young slightly puberulous along the nerves beneath; flowers very fragrant, rather small, pure white, on 4-5 lin. long greyish puberulous pedicels, forming greyish puberulous axillary racemes much shorter than the leaves; sepals 2-2½ lin. long, lanceolate, acute, greyish puberulous outside and silky-pubescent

along the keel inside; petals somewhat longer, puberulous along the margins, cuneate-oblong, deeply and finely fringed; anthers minutely papillose, the longer anther-cel blunt, terminated by a few short stiff white hairs; ovary silky tomentose; drupes oval, the size of a pigeon's egg, smooth, yellowish olive-coloured; the putamen oblong, wrinkled, 2-3-celled.

Hab.—Frequent in the tropical forests of Martaban and Tenasserim; also Andamans and Chittagong.—Fl. Apr.-May; Fr. Aug.—s.—SS. = Metam.

17. **E. stipularis,** Bl.; H.f. Ind. Fl. i. 404.—A large evergreen tree, all younger parts pubescent; leaves from oblong and oblong-lanceolate to lanceolate, obtuse or rounded at base, on a shortly tomentose geniculate-thickened petiole 1-1½ in. long, 4-7 in. long, bluntish acuminate, obsoletely crenate-toothed, membranous, above glabrescent except on the more or less pubescent midrib, beneath more or less pubescent all over; flowers small, white, on 4 lin. long tomentose pedicels, forming slender shortly tomentose racemes in the axils of the leaves or above the scars of the fallen ones and nearly as long as them or rarely longer; sepals 2-2¼ lin. long, oblong-lanceolate, acute, shortly puberulous outside and velvety along the inner margin and keel inside; petals somewhat longer, broadly cuneate oblong, deeply and finely fringed, tomentose-ciliate; anthers minutely papillose-puberulous, the cells shortly hispid at the blunt apex; ovary and the short style silky pubescent; drupes the size and shape of a plum, the putamen coarsely wrinkled and pitted, usually 1-celled.

Hab.—In the tropical forests of Martaban and Tenasserim up to 3,000 feet elevation.—Fl. May.

LINEÆ.

Flowers regular, hermaphrodite. Sepals 5, rarely 4, free or connate at base, imbricate. Petals as many, often fugaceous, often twisted-imbricate. Stamens 4-5, alternating with as many staminodes, or 8-10, rarely more, and all fertile; anthers versatile, 2-celled. Hypogynous glands 5, usually adnate to the staminal ring, or obsolete. Ovary 3-5-celled with as many free or more or less connate styles, the cells with 1 or 2 anatropous pendulous ovules. Fruit usually a capsule, rarely a drupe. Albumen fleshy or none.—Herbs or shrubs, rarely trees, with alternate simple leaves. Stipules lateral, intrapetiolar, or none. Flowers in cymes or panicles, or variously arranged.

Strong fibre is obtained from many species of this family, and *Linum usitatissimum* yields the well-known flax. The seeds of some yield also oil.

Fruit a septicidal capsule. Petals without scale . . . *Reinwardtia.*
Fruit a drupe. Petals with a scale on the inside . . . *Erythrospermum.*

ERYTHROXYLON, L.

Sepals 5, free or connate. Petals 5, with an erect double scale on the inner face, imbricate. Stamens 10 or 12, united in a tube. Ovary 3- rarely 4-celled, with 1 or 2 ovules in each cell. Drupe by abortion 1-celled and 1-seeded. Albumen none or present.—Shrubs or small trees, with alternate simple entire leaves. Stipules intrapetiolar. Flowers small, axillary, solitary, or fascicled.

* *Styles free from the base; leaves shortly acuminate* . *E. Kunthianum.*
* * *Styles united half-way.*
Leaves obovate or oblong, blunt; pedicels about 3 lin. long . . *E. monogynum.*
Leaves broadly obovate or oblong, retuse; pedicels short . . *E. Burmanicum.*

1. **E. Kunthianum,** Kz.; H.f. Ind. Fl. i. 414.—A small tree (20—30 + 4—10 + 2—3), stunted, shedding leaves in the CS., all parts glabrous; leaves oblong-lanceolate or lanceolate, obtuse at base, 3-4 in. long, shortly and bluntish acuminate, rarely blunt, shortly but slenderly petioled, entire, glabrous, chartaceous, glaucous beneath; stipules subulate; flowers small, white, on about ½ in. long slender pedicels thickened upwards, usually by pairs in the axils of the leaves or from above the scars of the fallen ones; petals oblong, with a large 2-lobed scale inside; stamens alternately shorter; ovary ovate; styles 3, short and thick, free from the base; drupes elliptically oval, 1-seeded, crimson, glossy.

Hab.—Not unfrequent in the drier hill-forests, especially the stunted ones, on the Martaban hills east of Tounghoo, at 6,000 to 7,200 feet elevation; also in the Thoung-gyeen hills of Tenasserim.—Fl. March—SS. = Metam.

E. monogynum, Roxb., according to Dr. Mason, is said to occur in Burma. It is a small glabrous tree with blunt leaves, the white small flowers on 3 rarely up to 6 lin. long pedicels, and styles united for ⅔ of their length.

2. **E. Burmanicum,** Griff.; H.f. Ind. Fl. i. 414.—A small tree with compressed branchlets, all parts quite glabrous; leaves broadly obovate or oblong, 3-4 in. long, very shortly petioled, retuse, entire, chartaceous or almost coriaceous, glaucous beneath, glossy above; stipules linear-lanceolate, acuminate; flowers small, on slender 2-3 lin. long pedicels thickened upwards, usually arising by pairs or several from the axils of the leaves; petals greenish-white, furnished inside with a toothed, erect, petaloid scale; stamens 10, erect, the alternating ones spreading; filaments slender, abruptly arising from the short truncate staminal tube; styles united for ½ of their length; stigmas capitate; drupes red, 3-angled, 1-seeded.

Hab.—Tenasserim.—Fl.-Apr.

MALPIGHIACEÆ.

Flowers hermaphrodite, regular or irregular. Calyx usually 5-parted, imbricate or valvate, one or more of the 5 segments furnished with a large gland, rarely glandless altogether. Petals 5, clawed or sessile, imbricate. Disk obsolete. Stamens 10 or more, hypogynous or nearly so, equal or unequal; filaments free or more or less connate at base; anthers 2-celled. Ovary 3-celled, with a solitary ovule in each cell; stigmas 3, free or connate. Fruit a 1-3 winged samara or capsule or a drupe. Albumen none.—Trees or shrubs, often climbing, with opposite simple leaves. Stipules minute or none. Flowers in axillary or terminal inflorescences.

* *Fruit drupaceous, not winged* . . . . . *Malpighia.*
** *Fruit dry, samaroid, or capsule-like, winged.*
○ Stamens definite, usually 10.
Style 1 or rarely 2. Capsule produced into 3 unequal wings.
Calyx with a single large gland . . . . . *Hiptage.*
Styles 3. Calyx glandless. Samara broadly winged all round . *Aspidopterys.*
○○ Stamens numerous. Calyx minute, glandless . *Plagiopteron.*

PLAGIOPTERON, Griff.

Sepals 5, minute. Petals as many, sepal-like, valvate. Stamens numerous, at the base united in a very short ring; anthers small, almost globular. Ovary 3-celled, with 2 ovules in each cell: style subulate, entire. Fruit dry, turbinate and truncate, 3-coccous, on the back produced into as many spreading wings.—A scandent shrub with opposite simple leaves. Stipules minute. Flowers small, cymose, in panicles.

1. **P. suaveolens,** Griff.; H.f. Ind. Fl. i. 399.—A scandent shrub, the younger parts minutely tawny stellate-puberulous; leaves ovate-oblong to oblong-lanceolate, obtuse at base, on a rather short shortly tomentose petiole, 4-5 in. long, cuspidate-acuminate, chartaceous, above glabrous except the puberulous nerves, beneath sprinkled with minute stellate hairs; flowers small, very fragrant, greenish, in dense cymes forming almost thyrsoid tawny and shortly stellate tomentose panicles in the axils of the leaves and usually shorter than them; sepals tooth-like; petals linear-oblong, revolute, densely puberulous outside; capsules indehiscent, the size of a large pea, truncate-turbinate, terete, stellate-puberulous, 3-celled, the wings 7-8 lin. long, narrow-oblong, blunt, narrowed at base.

Hab.—Tenasserim.

HIPTAGE, Gaertn.

Flowers irregular. Calyx 5-parted, with a large gland adnate to the pedicel. Petals 5, clawed, unequal. Stamens 10, declinate,

all fertile, one much larger than the rest, the filaments shortly connate at base. Ovary 3-celled and 3-lobed, the lobes appendaged; styles 1 or 2, circinnate, the others rudimentary. Fruit dry, truncate-obturbinate, produced into 2-3 unequal wings. Seeds almost globular. Albumen none.—Scandent or climbing shrubs, rarely small trees, with opposite leaves. Stipules none. Flowers rather showy, in axillary or terminal simple or compound racemes.

Scandent spreading shrub, branched from the base; leaves larger, more acute and greyish-green; bark grey . . . *H. Bengalensis.*
A lofty climber, the stem simple, cable-like, up to 100 ft. long; leaves smaller and broader, often bluntish apiculate, glabrous and glossy, dark-green; bark dark-brown . . . . *H. obtusifolia.*
A small erect tree, flowers often pale pink with the usual yellow basal blotch; capsule not ridged on top, the wings shorter and broader, obliquely truncate . . . . . *H. candicans.*

1. **H. Madablota,** Gaertn.; H.f. Ind. Fl. i. 418; Brand. For. Fl. 44.—A tall spreading scandent shrub, the trunk about a foot in girth; the young shoots more or less appressed-pubescent; leaves oblong- or ovate-lanceolate, on a thick 2-3 lin. long petiole, acuminate, 4-5 in. long, coriaceous, glabrous, glaucous green; flowers middling-sized, white, with the upper-petal citron-coloured at middle, on rather long, whitish silky-villous, 2-bracted pedicels, forming appressed pubescent axillary racemes shorter than the leaves and usually collected into a leafy terminal panicle; sepals 3-4 lin. long, blunt, pilose; petals about ¾ in. long, reflexed, shortly and abruptly clawed, fimbriate; carpels slightly pubescent, the wings oblong, sometimes obscurely lobed, the inner one erect, 1½ in. long, the 2 outer shorter and spreading, the central ridge obsolete, sharp, or often growing out into an additional short wing.

Hab.—Not unfrequent in the dry and open, especially the Eng, forests of Prome and Martaban; also Upper Tenasserim.—Fl. March-Apr.; Fr. Apr.-May.—l.—SS.=Dil., CaS., etc.

2. **H. obtusifolia,** DC.—A lofty woody evergreen climber, the trunk simple, cable-like up to 100 ft. long, the young shoots slightly silky pubescent; leaves oblong to elliptically oblong, on a 2-3 lin. long, strong, glabrous petiole, acute or obtuse at base, apiculate, 2-4 in. long, coriaceous, glabrous, glossy and dark-green above; flowers middling-sized, white, with a citron-coloured blotch on the upper petal, on slender, 4-7 lin. long, whitish woolly pedicels, forming whitish woolly-pubescent slender racemes in the axils of the leaves or sometimes collected in a spurious terminal panicle; sepals concave-rotundate, obtuse, densely greyish pubescent, about 3 lin. long; petals ½ in. long or longer, rotundate, shortly clawed, villous-fringed; carpels not seen.

Hab.—Rather rare in the tropical forests of the deep ravines of the Pegu Yomah.—Fl. Febr.-March.—s: l.—SS.=SiS.

3. **H. candicans,** H.f. Ind. Fl. i. 419.—*Toung-sooka-pan.*—A tree (15—20+3—6+1—2), shedding leaves in HS.; the shoots thickly whitish or yellowish tomentose; leaves very variable in shape and size, from oblong and ovate-oblong to elliptical and elliptically lanceolate, 2-3½ in. long or longer, on a very short strong petiole, obtuse or rounded at base, almost coriaceous, while young covered with a dense whitish tomentum and acute or shortly acuminate, afterwards slightly floccose hairy and apiculate or often rounded at apex, the nervation and net-veination strongly prominent beneath; flowers white or more usually lilac, with the usual golden basal blotch on the upper petal, on long whitish pubescent pedicels 1 or 2-bracted at about the middle, forming longer or shorter whitish pubescent racemes in the axils of the leaves or above the scars of the fallen ones; sepals 2-3 lin. long, blunt or acute, woolly pubescent; petals fimbriate and clawed; carpels more or less shortly tawny tomentose and glabrescent, the wings usually securiform-emarginate, very unequal, the erect one 1½ to nearly 2 in. long, the lateral spreading ones about ⅔ shorter, the central ridge obsolete.

Hab.—Frequent in the dry and Eng forests of the Prome District and a principal constituent of the upper dry forests.—Fl. March; Fr. March-Apr.—l.—SS.=CaS., Lat.

ASPIDOPTERYS, A. Juss.

Calyx 5-parted, without glands. Petals sessile. Stamens 10, all perfect, free or shortly united at base. Ovary 3-lobed, the lobes complanate on the back and winged along the borders; styles 3 with capitate stigmas. Samaras 3, shield-shaped and broadly winged, often furnished with a wing-like small crest half-way between the wings.—Scandent shrubs. Stipules none. Flowers small, in terminal or axillary panicles or racemes.

* *Gynobase persistent after the fall of the samaras, conical, acute, exserted, surrounded by 3 smooth acute disk-lobes.*

Leaves tomentose beneath, acuminate; ovary hirsute . . . *A. nutans.*
Leaves tomentose beneath, more or less glabrescent, apiculate; ovary quite glabrous . . . . . *A. tomentosa.*

* * *Gynobase absent after the fall of the samaras, or minute and shorter than the disk-lobes; the thick 3-lobed often cup-shaped disk usually wrinkled.*

× Samara nearly as broad as long.

All parts, also the ovary, quite glabrous; disk in fruit about a line long . . . . . *A. concava.*
Leaves more or less puberulous on the nerves beneath; disk doubly smaller, hardly wrinkled . . . . . *A. Helferiana.*

× × Samara more than twice so long as broad, not crested.

All parts glabrous; ovary hirsute . . . . . *A. Roxburghiana.*
All parts hirsute; ovary glabrous . . . . . *A. hirsuta.*

* *Gynobase persistent after the fall of the samaras, conical, acute, exserted, surrounded by 3 smooth acute disk-lobes.*

1. **A. nutans,** H.f. Ind. Fl. i. 421.—A woody climber, the younger parts rusty woolly; leaves ovate or ovate-oblong, on a rusty-tomentose or woolly petiole ½-1 in. long, rounded or slightly cordate at base, 4-5 in. long, acuminate, membranous, glabrous above, beneath woolly-tomentose and usually rusty-woolly on the nerves; flowers small, on slender glabrous 5-6 lin. long pedicels, in small umbels, forming rusty-woolly glabrescent panicles in the axils of the leaves and larger ones at the end of the branchlets; petals about 2 lin. long; ovary hirsute; samaras about 1½ in. long, ovate-oblong, entire or slightly notched, without or with a very narrow inconspicuous crest between the brown opaque chartaceous wings; gynobase pyramidal, very acute, glabrous; the disk-lobes stiff, black, very acute, smooth.

Hab.—Chittagong and Ava.—Fr. Jan.

2. **A. tomentosa,** A. Juss.—A large woody climber with terete brown stems, the younger parts rusty-tomentose; leaves obovate-oblong or broadly oblong, rounded or almost cordate at base, 4-5 and often up to 6 in. long, on a rusty-tomentose often glabrescent petiole ½-1 in. long, shortly acuminate or usually apiculate, membranous, glabrous above, tomentose beneath; flowers small, white, on long slender glabrescent pedicels, in poor umbellets, forming long rusty-woolly glabrescent panicles in the axils of the leaves or at the end of the branchlets; petals about 2 lin. long; ovary perfectly glabrous; samaras broadly oblong, about an in. long, with a vertical wing-like small crest between the more or less opaque brownish notched wings; gynobase pyramidal, 3-sided, very acute, surrounded by the short indurated sharply 3-toothed disk.

Hab.—Not unfrequent in the tropical forests of Martaban.—Fl. March.—Fr. May.

* * *Gynobase absent after the fall of the samaras or minute and shorter than the disk-lobes, the thick 3-lobed often cup-shaped disk usually wrinkled.*

3. **A. concava,** Juss.; H.f. Ind. Fl. i. 420.—A woody glabrous climber, the very young shoots rusty puberulous; leaves ovate-lanceolate, 4-5 in. long, rounded or obtuse at the base, on a rusty puberulous glabrescent petiole ½-1 in. long, bluntish acuminate or rarely retuse or retuse-acuminate, glabrous, chartaceous; flowers small, on slender 6-8 lin. long glabrous pedicels, in loose umbellets, forming shorter or longer rusty puberulous but very soon glabrescent panicles in the axils of the leaves and at the end of the branches; petals 2 lin. long; ovary quite glabrous; samaras about an in. long

or longer, almost orbicular, with a semi-oblong crest between the white or pale straw-coloured very pellucid shining wings; gynobase absent; the indurated black wrinkled disk shortly and broadly 3-lobed.

Hab.—Tenasserim.—Fl. Fr. Apr.

4. **A. Helferiana,** Kz.—A woody climber, the young shoots tawny pubescent; leaves orbicular-ovate to broadly oboval, shortly cuspidate or apiculate, on a pubescent glabrescent petiole ½-¾ in. long, 3-5 in. long, usually glaucous-green; flowers small, glabrous, on filiform glabrous pedicels about 2 lin. long, forming a lax while young rusty-pubescent but soon glabrescent panicle in the axils of the leaves and at the ends of the branches; petals about 2 lin. long; ovary quite glabrous; gynobase deciduous, the disk-lobes hardly wrinkled; samaras ovoid, about an inch long, retuse at the narrowed apex, hyaline, membranous, pale brown, radiately nerved, glabrous, winged-crested.

Hab.—Tenasserim.—Fl. Febr.

5. **A. Roxburghiana,** A. Juss.; H.f. Ind. Fl. i. 420.—A woody climber, the younger parts rusty puberulous, glabrescent; leaves ovate or ovate-oblong, on a rusty puberulous glabrescent petiole 6-8 lin. long, rounded at base, acuminate, membranous, glabrous; flowers small, on 1-2 lin. long filiform pedicels, in poor umbellets, forming slender rusty pubescent glabrescent panicles in the axils of the leaves and at the end of the branchlets; petals about a line long; ovary hirsute; samaras elliptically oblong, about 1½ in. long by 7-8 lin. broad, not crested between the brownish scarious slightly notched wings; gynobase none, the indurated black wrinkled disk shortly 3-lobed.

Hab.—Ava; Tenasserim.

6. **A. hirsuta,** A. Juss.; H.f. Ind. Fl. i. 421.—A large woody climber, all parts tawny hirsute; leaves oblong or obovate-oblong, on short hirsute petioles, 4-6 in. long, rounded at base, shortly and sharply acuminate, membranous, on both sides covered with rather long whitish or tawny hairs, pale-coloured beneath; flowers rather large, white, on 5-6 lin. long hirsute pedicels, in rather dense little umbels, forming hirsute conspicuously bracted panicles in the axils of the leaves and at the end of the branchlets; petals nearly 3 lin. long; ovary quite glabrous; samaras oblong, 2 in. long or a little longer, by 8-9 lin. broad, not crested between the brown opaque wings; gynobase none, the black indurated wrinkled disk 3-lobed.

Hab.—Ava and Prome District.—Fl. Fr. August-November.

GERANIACEÆ.

Flowers hermaphrodite, regular or irregular. Sepals 5, rarely 4 or 2, free or connate to the middle, imbricate or rarely valvate, the posticous one sometimes spurred. Petals as many or fewer, rarely none, hypogynous or almost perigynous, variously imbricate. Torus scarcely expanded into a disk, with 5 glands alternating with the petals, or without glands, raised in the centre into a beak, rarely flat. Stamens as many or 2 or 3 times as many as sepals, rarely fewer; filaments free or connate in a ring; anthers 2-celled, the cells opening lengthwise. Ovary 3-5-lobed and -celled, with 1 or 2 horizontal pendulous or ascending ovules; the styles free or more or less connate. Fruit a capsule, dry, and the valves separating from the axis, or fleshy, and elastically dehiscing, rarely a drupe or berry. Albumen none or scanty, or fleshy.—Herbs or undershrubs, rarely trees, with opposite or alternate simple or variously lobed or pinnate leaves. Stipules present. Flowers various, often showy, solitary or in various inflorescences.

AVERRHOA. L.

Flowers regular. Sepals 5, imbricate. Petals 5, twisted. Glands none. Stamens 10, all perfect, or the alternating ones without anthers. Ovary 5-celled and-lobed with numerous ovules in each cell; styles free. Berry 5-lobed. Seeds nude or with an arillus. Albumen scanty, fleshy.—Small trees, with alternate unpaired-pinnate leaves. Stipules none. Flowers small, in axillary panicles or cymes.

Fruits sharply angled; seeds arillate	*A. Carambola.*
Fruits obtusely angled; seeds without arillus . . .	*A. Bilimbi.*

1. **A. Carambola,** L.; H.f. Ind. Fl. i. 439; Bedd. Sylv. Madr. 39; Brand. For. Fl. 45.—*Soungyah.*—An evergreen tree (25—35 + 8—10 + 3—4); leaves unpaired-pinnate, on a rather long petiole, usually slightly puberulous; leaflets in 4 to 5 pairs with an odd one, more or less obliquely ovate or ovate-lanceolate, acuminate, glabrous, or rarely more or less pubescent, glaucous beneath; flowers small, purplish, in axillary racemose panicles much shorter than the leaves; sepals glabrous, about a line long; petals rotundate; stamens 10, 5 of them usually very minute and without anthers, or occasionally 1 or 2 of them longer with small barren anthers; berries oblong, about 2 in. long, sharply 5-angled, waxy-green; seeds arillate.

Hab.—Much cultivated all over the country in native gardens, etc., in two varieties, the one with sweet, the other with acid fruits.

Remarks.—Wood dark-brown.

2. **A. Bilimbi,** L.; H.f. Ind. Fl. i. 439; Bedd. Sylv. Madr. t. 117; Brand. For. Fl. 46.—A small evergreen tree, all softer parts more or less pubescent; leaves unpaired-pinnate, pubescent; leaflets in 5 to 10 pairs with an odd one, oblong-lanceolate, acuminate, 2-3 in. long; flowers small, purple, in short axillary pubescent panicles; sepals pubescent, about 1½ lin. long; petals ovate-oblong; stamens 10, all fertile; berries oblong, about 2 in. long, obtusely 5-angled, waxy green; seeds without arillus.

HAB.—Rarely cultivated by natives in Pegu and Tenasserim.

RUTACEÆ.

Flowers regular, usually hermaphrodite. Calyx various, gamosepalous or the sepals free. Petals as many as sepals or twice as many or rarely more, free or rarely cohering, imbricate or valvate. Stamens definite or rarely numerous; anthers usually versatile, the cells opening lengthwise. Torus inside the stamens, usually more or less thickened into a disk. Ovary consisting of 4 or 5, rarely more or fewer carpels more or less united or rarely quite free; ovules 2, collateral or more usually superposed or solitary in each carpel; styles united at their apices or thoroughly. Fruit of 2-valved or rarely indehiscent carpels, or a berry or drupe, rarely a dehiscent capsule, the endocarp frequently separating from the pericarp. Seeds often solitary in the carpels. Albumen fleshy or none. Embryo large in proportion to the seed, radicle superior.—Trees or shrubs, very rarely herbs, all herbaceous parts pellucid-gland-dotted. Leaves opposite or alternate, simple or compound. Stipules none. Flowers solitary or variously arranged, axillary or terminal.

The members of this family possess nearly all aromatic and pungent properties. The bark of some kinds like *Toddalia* are used as a febrifuge. The species of the orange-tribe abound in a volatile fragrant bitter oil, and several of them, like the oranges, limes, bael, etc., reckon amongst the best table-fruits. To foresters the family is interesting, as it furnishes a variety of so-called box-wood. About 33 or 34 Burmese species are known, but their generic characters are rather vague and uncertain.

* *Fruit separating into distinct 2-valved carpels. Flowers often unisexual.*

Leaves opposite or nearly so. Usually unarmed. Stamens 4-5 . *Evodia.*
Leaves alternate. Usually armed. Stamens 3-5 . . . . *Zanthoxylon.*
Leaves opposite. Unarmed. Stamens 8 . . . . . *Melicope.*

* * *Carpels consolidated into a drupe or berry, rarely a capsule.*

× Flowers usually polygamous-dioecious.

Leaves 3-foliolate. Armed climbers . . . . . *Toddalia.*
Leaves simple. Unarmed erect trees or shrubs . . . . *Acronychia*

× × Flowers hermaphrodite. Berry usually pulpy, with a leathery skin.
○ Ovary-cells with 1 or 2 ovules only.
† Style persistent, not jointed at base . . *Glycosmis.*
†† Style deciduous, jointed at base.
△ Leaves 3-foliolate or pinnate.
‖ Ovules 2 in each cell.
Unarmed. Leaves pinnate. Flowers in terminal corymbs . . *Micromelum.*
Unarmed. Filaments dilated at base. Leaves pinnate. Flowers in panicles or racemes . . . . . *Clausena.*
Unarmed. Filaments linear-subulate. Leaves pinnate. Flowers in terminal cymes . . . . . *Murraya.*
Armed or not. Calyx cup-shaped Leaves 3-foliolate . . . *Luvunga.*
‖‖ Ovules solitary in the cells.
Calyx 3-lobed. Stamens 6. Spiny; leaves 3-foliolate; flowers almost solitary . . . . . *Triphasia.*
Calyx 4- or 5-lobed or -parted. Stamens 8-10. Leaves pinnate . *Limonia.*
△ △ Leaves 1-foliolate or simple.
Berry terete, or 5-3-angular with cellular or without pulp. Disk cup-shaped . . . . . *Atalantia.*
Berry terete, with cellular pulp. Disk elongate . . . . *Paramignya.*
○○ Ovary-cells with numerous ovules.
† Skin of berry leathery. Leaves 1-foliolate . *Citrus.*
†† Skin of berry woody.
Leaves pinnate. Ovary 5-6-celled . . . . . *Feronia.*
Leaves 3-foliolate. Ovary 6- or more-celled . . . . . *Aegle.*

EVODIA, Forst.

Flowers more or less completely unisexual. Sepals 4 or 5, valvate or nearly so. Disk sinuate. Stamens 4-5; the filaments subulate. Ovary consisting of 4 or 5 two-ovuled carpels, usually distinct and style-shaped in the males, more or less united in the females. Fruits more or less completely separating into coriaceous 2-valved carpels, the endocarp separating elastically. Testa of seeds crustaceous. Albumen fleshy.—Unarmed trees or shrubs, with opposite (rarely the one or other alternate) pinnate or 3-1-foliolate leaves. Flowers small, usually in axillary cymes or panicles.

× Inflorescence small, contracted, usually much shorter than the petioles.
Branchlets 4-angled and marked by 4 prominent longitudinal lines; leaves 3-1-foliolate; leaflets sessile . . . . *E. viticina.*
Branchlets terete; leaves 3-foliolate; leaflets shortly petioluled . *E. triphylla.*
× × Panicles corymb-like, spreading, as long or longer than the petioles. Leaves 3-foliolate . . . . *E. Roxburghiana.*

1. **E. viticina,** Wall.; H.f. Ind. i. 489.—An evergreen shrub (?), the branchlets marked with 4 prominent acute decurrent lines, the young shoots puberulous; leaves on a slightly winged petiole ½-¾ in. long, 3- or 1-foliolate on the same or on different branchlets, glabrous; leaflets lanceolate or obovate-lanceolate, 2-3½ in. long, almost sessile, narrowed at the base, membranous, shortly acumi-

nate, pale-coloured beneath; panicles small and contracted, puberulous, usually much shorter than the petiole or nearly as long; flowers small, very shortly pedicelled; petals 4, linear-oblong, blunt, rather coriaceous; carpels not seen.

Hab.—Tenasserim.

2. **E. triphylla,** DC.; H.f. Ind. Fl. i. 487 (*E. gracilis,* Kz.)—A meagre slender shrub, 3-5 ft. high, the branchlets quite terete, the young shoots puberulous; leaves 3- and occasionally 1-foliolate, opposite and almost alternate on the same plant, glabrous, on an 1-4 in. long hardly marginate petiole; leaflets lanceolate or broadly lanceolate, acuminate at both ends, shortly petioluled, 3½-4 and up to 5 to 7 in. long, chartaceous; panicles small and contracted, much shorter than the petioles, puberulous, glabrescent; flowers small, whitish, on short but slender puberulous pedicels; petals 4, oblong-lanceolate, acute; ovary puberulous, 4-celled; carpels usually 4, 2-3 lin. long, dotted, glabrous; seeds the size of a pepper-kernel, glossy black or brownish-black.

Hab.—Frequent in the damp hill-forests, entering the drier ones, from Martaban down to Tenasserim, at 3,000 to 5,000 ft. elevation.—Fl. Febr.-March; Fr. Apr.-May.—s.—SS. = Metam.

Remarks.—Wood light, pale pinkish, close-grained, straight-fibrous, with silvery lustre.

3. **E. Roxburghiana,** Bth.; H.f. Ind. Fl. i. 487 (*E. triphylla,* Bedd. Sylv. Madr. 41, t. 6, f. 3).—An evergreen tree (25—30 + 8—12 + 2½—3), the tender parts puberulous; leaves 3-foliolate, on a 2 to 5 in. long petiole, glabrous; leaflets lanceolate or oblong-lanceolate, usually narrowed at base, 4-6 in. long, on a shorter or longer petiolule, shortly acuminate, membranous, glaucous bluish-green, usually glossy above; panicles corymbose, divaricate, as long or longer than the petioles, greenish-puberulous; flowers yellowish white, small, on short but slender puberulous pedicels; petals 4, ½ lin. long or a little longer; ovary hirsute; stamens glabrous, exserted; carpels usually 4, when ripe about 2 lin. long, wrinkled and dotted, glabrous; seeds the size of a pepper-kernel, glossy, black or bluish-black.

Hab.—Tropical forests of Tenasserim and the Andamans.

ZANTHOXYLON, L.

Flowers more or less completely unisexual. Calyx 3-5-lobed. Petals 3-5, imbricate or rarely valvate, or wanting. Disk small or obsolete. Stamens in males 3-5, in females none or reduced to staminodes. Ovary in males rudimentary or of 3-5 style-shaped carpels, in females of 1-5 distinct 2-ovuled carpels. Fruit

consisting of 1-5 distinct carpels, dry or drupaceous, usually 2-valved, the endocarp adherent or separating. Testa of seeds crustaceous, shining. Albumen fleshy.—Shrubs or trees, sometimes scandent, usually armed with sharp prickles. Leaves alternate, usually pinnate. Flowers small, in axillary or terminal cymes or panicles.

* *Cymes axillary, or axillary and terminal. Branches alternate. Leaves pinnate.*

× Rachis of leaves winged. Flowers apetalous.

Leaflets 2-3 in. long, glandular-crenulate . . . . . *Z. acanthopodium.*
Leaflets coarsely crenate, ½-1 in. long, blunt . . . . *Z. Andamanicum.*

×× Rachis of leaves not winged. Flowers polypetalous *Z. Hamiltonianum.*

** *Cymes terminal. Branches opposite. Leaflets glandular-crenate* . . . . . *Z. Budrunga.*

1. **Z. acanthopodium,** DC.; H.f. Ind. Fl. i. 493.—A small tree, armed with straight, longer or shorter, sharp, usually compressed prickles, all parts glabrous; leaves unpaired-pinnate, 5-6 in. long; the rachis flat and narrowly winged, on the back armed with straight, sharp, long prickles; leaflets in 6 to 2, usually 4, pairs with an odd one, unequal at the base and sessile, lanceolate to oblong-lanceolate, acuminate, glandular-crenulate, 2-3 in. long, membranous or chartaceous, glabrous, beneath with or without scattered glands, the midrib often with a few long sharp prickles; flowers small, apetalous, pediceled, forming small rather dense panicles of only ½-1 in. length, glabrous or pubescent; ripe fruit-carpels usually by 4-2, the size of a pepper-kernel, obliquely ovoid.

Hab.—Burma, hills east of Bhamo.

2. **Z. Andamanicum,** Kz.—An evergreen half-scandent shrub, sparingly armed with short, sharp, somewhat curved prickles, the young shoots slightly pubescent; leaves unpaired-pinnate, 2-4 in. long, the petiole narrowly winged and unarmed; leaflets in 3 to 4 pairs with an odd one, almost sessile, unequally rhomboid (the terminal one cuneate-obovate), ½-1 in. long, blunt, membranous, on the outer margin, except towards the apex, entire, along the inner margin coarsely crenate, sparingly pubescent on the midrib beneath; flowers and fruits unknown.

Hab.—Tropical forests of the Andaman islands.—s.—SS. = Metam.

3. **Z. Hamiltonianum,** Wall.; H.f. Ind. Fl. i. 494.—An evergreen shrub, probably scandent, sparingly armed with short recurved prickles, glabrous, or the young parts tomentose or pubescent; leaves unpaired-pinnate, 6 to 8 in. long, the petiole and rachis rather terete, glabrous or pubescent, on the back armed with recurved prickles; leaflets in 2-3 pairs with an odd one, on short petioles, oblong to ovate-oblong, 2-6 in. long, abruptly and rather

long acuminate and notched, coriaceous, entire or nearly so, glossy on both sides, glabrous, or beneath somewhat pubescent; cymes panicled, very slender, 3-4 in. long, glabrous, pubescent or tomentose; flowers small, shortly pedicelled; fruiting carpels obliquely ovoid, the size of a pepper-kernel, pitted, glabrous.

Hab.—Ava.

4. **Z. Budrunga,** DC.; H.f. Ind. Fl. i. 495.—*Maya-ning.*—An evergreen tree, (50—60 + 18—30 + 5—6), all parts glabrous, the stem reddish-grey, armed with woody somewhat compressed oval tubercles terminated by a short, straight, sharp prickle; bark corky-rough, about 2 lin. thick; cut rather dry, yellowish; leaves somewhat crowded at the end of the branchlets, pinnate, glabrous, the petiole and sometimes the rachis with a few short curved prickles; leaflets from 7-10 pairs with an odd one, 3 to 6 in. long, the lower ones gradually smaller, very oblique, oblong lanceolate or oblong, very shortly petioluled, cuspidate, membranous, bluntish crenate-serrate or entire, glabrous; flowers minute, greenish-white, in trichotomous, glabrous or slightly puberulous, axillary panicles much shorter than the leaves and crowded at the ends of the branches, the common peduncle prickly-armed; petals 4, about $\frac{1}{2}$ lin. long; ovary glabrous; ripe carpels solitary, the size of a pea, 2-valved, covered with balsamic vesicles, one-seeded; seeds globular, polished, black.

Hab.—Not unfrequent in the tropical and moister upper-mixed forests from Chittagong, Pegu, and Martaban down to Tenasserim.—s.—SS. = SiS., Metam.

Remarks.—Wood rather heavy, white, soon turning yellowish, with silvery lustre, close-grained, soft.

MELICOPE, Forst.

Calyx 4-lobed or-parted. Petals 4, spreading, valvate or imbricate. Disk large, entire, 8-lobed, or obsolete. Stamens 8, inserted at the base of the disk, alternately shorter; filaments subulate or flat; anthers oblong or cordate. Ovary 4-celled, deeply 4-lobed, with 2 collateral or superposed ovules in each cell; style basal or styles 4 and almost terminal, more or less combined; stigma capitately 4-lobed. Capsule of 4 free spreading coriaceous carpels dehiscing along the inner face, the endocarp more or less separating. Albumen oily-fleshy.—Shrubs, with opposite 1-3-foliolate leaves. Flowers small, in axillary cymes or panicles.

1. **M. (?) Helferi,** H.f. Ind. Fl. i. 492.—Dioecious (?), quite glabrous; bark wrinkled; leaves 1-foliolate, on a stout $\frac{1}{4}$-1 in. long petiole not sharply bordered; leaflets obovate-lanceolate, blunt, 4-8 in. long, membranous, the nerves horizontal, very slender; cymes 1-3 in. long, forming a few-flowered panicle rather longer than the

petiole ; peduncle rather stout, quite glabrous ; male flowers small, fascicled, on short stout pedicels ; petals valvate, longer than the stamens ; disk 8-lobed. (After Hooker.)

Hab.—Tenasserim or Andamans.

TODDALIA, Juss.

Flowers more or less completely unisexual. Calyx 2-5-toothed or-parted. Petals 2-5, imbricate or valvate. Torus obsolete or somewhat elongate. Males : Stamens 2, 4 or 5 (or 8, the alternating ones reduced to staminodes) ; filaments subulate or filiform. Ovary rudimentary, entire or 4-parted. Females : ovary sessile or shortly stalked, 2-7-very rarely 1-celled, with 2 ovules in each cell ; stigma sessile or nearly so, capitate. Fruit coriaceous or fleshy, gland-dotted, 1-7-celled. Testa of seeds coriaceous. Albumen fleshy.—Shrubs, usually scandent, armed or unarmed, with alternate 3-foliolate leaves ; flowers small, in axillary or terminal cymes or panicles.

1. **T. aculeata,** Pers. ; H.f. Ind. Fl. i. 497 ; Bedd. Sylv. Madr. 42, t. 6, f. 5.—*Kyan-zah.*—A large scandent shrub, the young parts more or less rusty-tomentose ; stem armed with numerous woody tubercles terminated by black, short, curved prickles, the branches hooked and spiny ; bark brownish, whitish lenticellate ; leaves 3-foliolate, glabrous, on a ¾ to 1 in. long unarmed or prickly petiole ; leaflets obovate-oblong, more or less narrowed at base, very shortly petioluled or almost sessile, apiculate or bluntish acuminate and often notched, obtusely crenate-toothed, membranous or chartaceous, 2-3 in. long, the lateral nerves rather parallel ; flowers small, greenish or yellowish-white, on rather short puberulous pedicels, forming more or less rusty puberulous rather simple axillary panicles much longer than the petioles ; petals linear-lanceolate, acute, about 3 lin. long ; stamens 5 ; berries almost globose, the size of a small pea, reddish or yellowish, 5-7-celled, covered with aromatic-oily vesicles.

Hab.—Frequent in the tropical and moister hill-forests from Martaban and Ava down to Tenasserim, up to 4,000 ft. elevation ; also along the eastern slopes of the Pegu Yomah.—Fl. June ; Fr. March-Apr.—s.—SS.=Metam. SiS.

ACRONYCHIA, Forst.

Flowers polygamous. Calyx short, 4-lobed, imbricate. Petals 4, valvate. Torus thick, 8-angular. Stamens 8, alternately shorter ; filaments subulate. Ovary 4-celled, with 2 superposed ovules in each cell ; the style simple. Fruit 4-celled, usually drupaceous, rarely capsular and opening loculicidally. Testa of seeds crusta-

ceous. Albumen fleshy.—Trees or shrubs, with opposite or alternate 1-3-foliolate leaves. Flowers small, usually in axillary panicles or lax cymes.

1. **A. laurifolia,** Bl. ; H.f. Ind. Fl. i. 498. (*A. pedunculata,* DC. ; Bedd. Sylv. Madr. 43, t. 6, f. 4).—A small shrubby tree or large shrub, 10-25 ft. high, the trunk 3-8 ft. long by 1-2-ft. girth, evergreen, all parts glabrous ; leaves 1-foliolate, rather shortly petioled, oblong-lanceolate, ovate-oblong to obovate, about 3-5 in. long, apiculate or blunt, entire, minutely pellucid-dotted, glaucous green, glabrous ; flowers small, white, on rather long straight pedicels, forming corymb-like trichotomously branched rather long-peduncled panicles in the axils of the leaves and terminal ; petals hirsute at base inside ; ovary tomentose ; drupes the size of a large pea, obscurely 4-angled, apiculate, glabrous.

Hab.—Not unfrequent in the tropical coast forests of the Andamans ; also Pegu, above Rangoon ; Chittagong.—Fl. R. S.—s.—SS.=SiS.

GLYCOSMIS, Corr.

Calyx 5-parted, imbricate. Petals 5, imbricate. Stamens 10, free ; filaments dilated upwards or downwards, or rarely filiform ; anthers often furnished with a gland on the back or at the tip. Disk stalk- or cushion-like. Ovary 2-5-celled, with a solitary pendulous ovule in each cell ; style not jointed at base and persistent. Berry pulpy, 1-3-seeded. Testa of seeds membranous.—Shrubs or little trees, with alternate pinnate or 1-foliolate leaves. Flowers small, in axillary or terminal panicles.

× Berries oboval-oblong or oblong, leaden-blue. Filaments flat, broader upwards and widened into a triangular apex.

Bark white ; leaves from 5- to 1-foliolate . . . . . *G. cyanocarpa.*

× × Berries more or less globular, from watery flesh-coloured to crimson. Bark white or pale-coloured.

Filaments from a broader base gradually narrowed upwards ; petals deciduous, 1-½ lin. long. . . . . *G. trifoliata.*

Filaments filiform, very long ; petals deciduous, about 3 lin. long. . *G. arborea.*

Filaments flat, upwards broader with a triangular apex ; petals longer persistent, almost obovate, nearly 1½ lin. long ; anthers conspicuously gland-tipped . . . . . *G. pentaphylla.*

1. **G. cyanocarpa,** Spreng.—*Taw-shouk.*—An evergreen shrub, often growing out into a small tree, all parts glabrous, the branchlets pale-coloured ; leaves very variable, from 5- to 1-foliolate, pinnate, on a shorter or longer petiole ; leaflets oblong to lanceolate-oblong, acute at the base, shortly petioluled, if pinnate 2 to 5 in., if simple up to a foot, long, longer or shorter bluntish acuminate, thin coriaceous or chartaceous, glabrous, often somewhat silvery beneath ; flowers white, rather small, shortly pediceled, variously cymose or in almost sessile or peduncled usually glabrous panicles axillary or

axillary and terminal; calyx small, 5-lobed; petals obovate, about 2 lin. long, longer persistent; filaments flat, tapering from a broader base; anthers blunt; berries obovoid-oblong, nearly ½ in. long, smooth, leaden-blue.

HAB.—Not unfrequent in the tropical forests of the Pegu Yomah.—Fl. Apr.—s.—SS.=SiS.

2. **G. arborea,** Roxb.—An evergreen tree (25—30+8—10+2—3), all parts glabrous, the branchlets brownish; leaves pinnately 5-3-foliolate; leaflets lanceolate to oblong- or ovate-lanceolate, on an 1-2 lin. long petiolule, apiculate to bluntish acuminate, chartaceous, usually glossy; flowers white, rather conspicuous, almost sessile, forming short sessile or almost sessile rusty-tomentose panicles or cymes in the axils of the leaves and almost terminal; calyx rusty-tomentose, small, 5-lobed, the lobes acute or blunt; petals linear-lanceolate, recurved, nearly 3 lin. long, very deciduous; filaments filiform, elongate; anthers oblong, blunt, the cells parallel; ovary stalked or sessile; berries globular, the size of a small pea, smooth, crimson, succulent.

HAB.—Common in the tropical forests of the Andamans.—Fl. Feb.-March; Fr. Apr.-May.—s.—SS.=SiS., etc.

3. **G. trifoliata,** Spreng.—A large evergreen shrub, growing out into a small 12-15 ft. high tree with a stem 4-8 ft. long by 1-1½ ft. girth, all parts glabrous; bark greyish-brown; leaves unpaired-pinnate, on a shorter or longer petiole, glabrous, dark-green and glossy; leaflets in 2-1 pair with an odd one, rarely solitary, elliptically to ovate-lanceolate, acute at base, shortly petioluled, entire, chartaceous; flowers very small, very shortly pediceled, forming small tawny villous glabrescent short and rather dense panicles in the axils of the leaves; calyx hardly ½ lin. long; petals 1 lin. long; filaments flat, from a broad base gradually narrowed upwards; anthers not gland-tipped; ovary sessile, ovoid-oblong, tapering upwards in a thick short style; berries globular, the size of a pea, flesh-coloured, lucid, sappy, 1-2-seeded.

Var. 1, **trifoliata** proper; leaves drying green; panicles or cymes shorter, more or less rusty or tawny tomentose; ovary glabrous or tawny pubescent.

Var. 2, **fuscescens**; leaves fuscescent in drying; panicles larger and more compound, quite glabrous.

HAB.—Var. 2—Frequent in the tropical forest all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim and the Andamans; var. 1—Chittagong and Tenasserim—Fl. H. S.; Fr. R. S.—s.—SS.=SiS. Metam., etc.

REMARKS.—Wood yellowish-white, turning brownish, heavy, close-grained, of a fine fibre.

4. **G. pentaphylla,** Corr.; Brand. For. Fl. 49; Bedd. Sylv. Madr. 43, t. 6, f. 6.—A meagre evergreen shrub, 2-4 ft. high or higher, and often growing out in a small tree, the very young shoots rusty-villous; leaves unpaired-pinnate, or occasionally 3-1-foliolate, glabrous, the rachis sharply bordered or almost terete; leaflets more or less alternate, in 3 to 1 pairs with an odd one or solitary, from ovate-lanceolate and oblong to oblong-lanceolate, acute at base, very shortly petioluled, bluntish acuminate to bluntish, 3-5 in. long, obscurely crenate or entire, glaucous green; flowers rather small, white, almost sessile, forming stiff rather long almost glabrous panicles in the axils of the leaves, the peduncle longer or shorter, usually more or less compressed; calyx about ½ lin. long; petals 2 lin. long; filaments thick, flat, elongate-linear-pentagon; anthers with a terminal black (in a fresh state yellowish) gland; ovary ovoid-globular, with a short thick style; anthers gland-tipped; berries the size of a pea, globose, by abortion usually 1- or 2-seeded, watery fleshy-coloured, sappy.

Hab.—Frequent all over Burma, in the mixed and evergreen forests, and more especially in the shade of village bushes and in bamboo jungles.—Fl. C.S.; Fr. H.S.—s.+l.—SS.=∞.

MICROMELUM, Bl.

Calyx entire or 3-5-toothed or -lobed. Petals 5, valvate or almost imbricate. Stamens 10, free, alternately shorter. Torus inconspicuous, stalk-like; ovary 5-(rarely 2-6-) celled, with 2 superposed ovules in each cell; style deciduous, constricted at base. Berry 1-2-seeded. Testa of seeds membranous.—Unarmed small trees or shrubs, with alternate unpaired-pinnate leaves. Flowers small in terminal corymb-like panicles.

A small tree; petals 2½ lin. long; young berries shortly stalked glabrous . . . . . *M. pubescens.*
A little meagre shrub; ovary densely tawny hirsute; young berries sessile or nearly so, puberulous . . . . . *M. hirsutum.*

1. **M. pubescens,** Bl.; H.f. Ind. Fl. i. 501; Bedd. Sylv. Madr. 43, t. 7, f. 1.—*Ta-nyeng-hpo.*—An evergreen tree (25—30+16—12+2—3), all younger parts more or less densely puberulous; bark about a line thick, whitish, somewhat roughish; cut pale-coloured; leaves unequally pinnate, puberulous or glabrous, 1½ ft. long, the rachis usually more or less puberulous; leaflets in 3-7 pairs with an odd one, alternating or nearly so, oblong-lanceolate to broadly lanceolate, oblique at base, shortly petioluled, 5-7 in. long, acuminate, usually somewhat waved, entire or nearly so; flowers middling-sized, whitish, on short pedicels, forming terminal divaricate or crowded pale tawny appressed-pubescent corymb-like panicles; calyx more or less obsoletely 5-toothed, pubescent; petals about 2½ lin. long, pubescent, glabrescent; berries seated on the short stalk-like

torus, ovoid-oblong, also when young glabrous, gland-dotted, yellow, turning dull orange-red, terminated by the style scar.

Hab.—Frequent in the tropical and moister upper mixed forests all over Burma and adjacent provinces; also Andamans.—Fl. Jan.-March; Fr. Apr.-June—s.—SS.=Metam. SiS. etc.

Remarks.—Wood rather heavy, close-grained, white, turning yellowish, soft fibrous.

2. **M. hirsutum,** Oliv.; H.f. Ind. Fl. i. 502.—A low meagre, often simple-stemmed shrub, about 2-3 ft. high, rarely higher, all parts more or less shortly tawny hirsute or puberulous (rarely almost glabrous); leaves unpaired-pinnate, densely puberulous; leaflets in 5 to 10 pairs with an odd one, lanceolate or oblong-lanceolate, shortly but slenderly petioluled, very oblique at base, acuminate, obsoletely repand-serrate, usually 3-5 in. long; flowers small, whitish, on short hirsute pedicels forming more or less shortly tawny hirsute corymb-like panicles at the ends of the branchlets and in the axils of the upper-leaves; calyx shortly tawny hirsute, deeply 5-lobed; petals hardly 2 lin. long; ovary densely tawny hirsute; berries sessile or nearly so, oblong or obovoid, specially while young more or less puberulous, gland-dotted, crowned by the stylescar.

Hab.—Very frequent in the drier upper-mixed forest and the dry and low forests, all over Burma from Ava and Pegu down to Tenasserim.—Fl. March-Apr.; Fr. Begin. of R. S.—SS.=Metam., SiS., CaS. Lat., etc.

CLAUSENA, Burm.

Calyx 4-5-lobed or-parted. Petals as many, slightly imbricate. Stamens 8 to 10, free, alternately shorter; the filaments dilated towards the base; anthers short. Disk stalk-like; ovary stalked, 4-5 (rarely 2-3)-celled, with 2 ovules in each cell; style deciduous. Berry 2-5-celled. Testa of seeds membranous.—Unarmed shrubs, with unpaired-pinnate alternate leaves. Flowers small, in axillary and terminal panicles or lax racemes.

× *Panicles terminal.*

○ *Ovary glabrous.*

Softly villous; leaflets 5; flowers 4-merous . . . . . *C. macrophylla.*

Inflorescence and leaves glabrous; petiole and rachis terete or nearly so; leaflets usually 7 (5-9), not or hardly oblique . *C. heptaphylla.*

Inflorescence and leaves glabrous; rachis winged; leaflets 13-17, oblique . . . . . *C. Wallichii.*

○ ○ *Ovary more or less hirsute or pubescent.*

All parts, also the inflorescence, more or less shortly hirsute or puberulous; rachis terete; leaflets 15-30, oblique; flowers 4-merous . . . . . *C. excavata.*

Inflorescence and the muricate petioles densely and shortly tawny tomentose; leaflets 5-9; young berries densely fascicled-tomentose; flowers 5-merous . . . . . *C. Wampi.*

× × *Panicles raceme-like, axillary;* all parts pubescent; ovary glabrous . . . . . *C. suffruticosa.*

1. **C. macrophylla,** H.f. Ind. Fl. i. 504.—Branchlets as thick as a goose-quill, and as well as the terete petiole and panicle clothed with a soft spreading close-set velvety tomentum; leaves pinnately 5-foliolate, 1 ft. long; leaflets very shortly petioluled, equal or nearly oblique, acuminate, obscurely toothed, tomentose beneath, 5-7 in. long, pale on both sides; panicle stout, erect, with the peduncle 1 ft. long; flowers crowded, a lin. in diameter, shortly pediceled; calyx-lobes 4, minute, rotundate, acute; petals 4, broadly-oblong, concave, conspicuously glandular; filaments very short, much dilated below; ovary stalked, glabrous, gland-tubercled; immature berries oblong, obsoletely 4-angular at the truncate apex.

Hab.—Upper Tenasserim.

2. **C. heptaphylla,** W.A.; H.f. Ind. Fl. i. 504.—*Pyin-daw-thein.*—A large shrub, the younger parts usually slightly puberulous; leaves unpaired-pinnate, the petiole and rachis terete, glabrous or minutely puberulous; leaflets alternate, in 3-4 (rarely 2) pairs with an odd one, ovate to ovate-lanceolate, shortly petioluled, not or slightly oblique at the unequal base, bluntish acuminate, 3-4 in. long, obsoletely repand-toothed or almost entire, covered with minute gland-dots, glabrous, the nerves beneath sometimes minutely puberulous; flowers very small, white or greenish-white, very shortly pediceled, forming terminal di-tri-chotomously branched glabrous panicles; petals about a line long; ovary glabrous, with a very short thick style; berries elliptical, about ½ in. long, usually 1- or 2-seeded, red, glabrous, vesicular-dotted.

Hab.—Chittagong,—Fl. H. S.; Fr. R. S.

3. **C. Wallichii,** Oliv.; H.f. Ind. Fl. i. 505.—A small meagre shrub, the very young shoots slightly pubescent, all parts emitting a very strong anisate odour; leaves unpaired-pinnate, with a slightly pubescent glabrescent narrowly winged rachis, the petioles sometimes sparingly tubercled; leaflets in 3 to 8 pairs with an odd one, remote and alternate, rhomboid-lanceolate or oblong, on a short and thick petiolule, 2-4 in. long, acuminate, obscurely crenate-serrate, glabrous, or slightly pubescent on the nerves; flowers small, yellow, on an in. long minutely puberulous pedicels, forming terminal panicles; petals about a line long; ovary glabrous or sprinkled with a few hairs, shortly stalked, the style short and rather thin; berries the size of a pea, ovoid, 1-2-seeded, glabrous, vesicular-dotted.

Hab.—Rare in the tropical forests of the eastern slopes of the Pegu Yomah (Khaboung choung); Tenasserim, Moulmein District; also Chittagong.—Fl. March; Fr. Apr.—s.—SS.=SiS. etc.

4. **C. excavata,** Burm.; Hook. Ind. Fl. i. 504.—An evergreen shrub, rarely growing out into a little tree of 10 to 15 ft. high,

all softer parts more or less pubescent or puberulous; leaves unpaired-pinnate, with a shortly pubescent or puberulous terete rachis; leaflets in 7-15 pairs with an odd one, alternate, on short hirsute petiolules, lanceolate or oblong-lanceolate, oblique, acuminate or the lower ones more or less blunt, obsoletely toothed or waved, more or less pubescent especially beneath, or sometimes glabrescent above, 1½-3, rarely 4 in. long; flowers small, greenish-yellow, on short but slender pedicels, usually hirsute outside, forming terminal tawny hirsute or puberulous panicles usually shorter than the leaves; petals nearly 2 lin. long; ovary tawny hirsute, almost sessile, the style short and thick; berries ovoid or oblong, the size of a pea, at least while young sparingly pilose, dotted, 1-2-seeded, crowned usually with the short style.

Hab.—Frequent all over Burma and adjacent provinces in the tropical and moister mixed forests from the plains up to 2,000 ft. elevation.—Fl. Apr.-May; Fr. June-July.—s.—SS.=SiS. Metam., etc.

5. **C. Wampi,** Blanco.; H.f. Ind. Fl. i. 505.—A small evergreen tree, the young shoots scabrously puberulous; leaves unpaired-pinnate, the petiole and rachis terete, more or less puberulous and sprinkled with minute tubercles; leaflets in 2-4 pairs with an odd one, on short but rather slender petiolules, alternate, ovate or ovate-lanceolate, more or less blunt, almost entire or obscurely serrulate, when full grown almost glabrous, but scabrous and sprinkled with minute tubercles along the principal nerves beneath; flowers small, white, on very short tomentose pedicels, forming terminal roughish and shortly tawny tomentose panicles of the length of the leaves or somewhat shorter; petals about 2 lin. long; ovary tawny hirsute, the style short and thick; berries while unripe covered with a short tawny fascicled tomentum, finally puberulous, the size and shape of a gooseberry, edible, 5- or by abortion fewer-seeded.

Hab.—Only cultivated in gardens of Chittagong.—Fl. Febr.-March; Fr. R.S.

6. **C. suffruticosa,** W.A.; H.f. Ind. Fl. i. 506.—A low simple-stemmed shrub or rather undershrub, 1 to 2 ft. high or higher, all younger parts softly pubescent; leaves unpaired-pinnate, with a terete pubescent more or less glabrescent rachis; leaflets in 2 to 8 pairs with an odd one, while young softly and densely pubescent and alternate, the older ones more or less glabrescent and opposite or nearly so, the lower ones cordate-ovate and smaller, the others ovate-oblong to oblong, acuminate, shortly petioluled, entire, about 3-3½ in. long; flowers small, greenish-white, on rather long slender hairy pedicels, forming simple racemes or raceme-like panicles in the axils of the leaves or above the scars of the fallen ones and shorter than the same; petals about 2 lin. long; ovary globular,

glabrous; berries oblong, drooping, nearly an in. long, one-seeded, orange-coloured, succulent.

Hab.—Chittagong; a small variety of it not unfrequent in the low, especially the Eng, and in the dry forests of the Prome District.—Fl. March; Fr. R.S.—l. —SS.= Aren., Lat., CaS.

MURRAYA, L.

Calyx more or less 5-cleft. Petals 5, imbricate. Stamens 10, free, alternately shorter; the filaments linear-subulate; anthers short. Disk stalk-like. Ovary 2-5-celled, with 1 or 2 ovules in each cell, narrowed in a long but deciduous style. Berry by abortion 1-2-celled with as many seeds. Testa of seeds glabrous or woolly.—Unarmed erect trees or shrubs with unpaired-pinnate alternate leaves. Flowers rather large or small, solitary or in terminal or axillary corymbs or cymes.

Leaflets 3 to 8; petals nearly ½ in. long; seeds villous . . . *M. exotica.*
Leaflets 10 to 20; petals about 2 lin. long; seeds glabrous . . *M. Kœnigii.*

1. **M. exotica,** L.; H.f. Ind. Fl. i. 502; Bedd. Sylv. Madr. 44; Brand. For. Fl. 48.—An evergreen tree (15—25 + 6—8 + 1½-2), the young shoots puberulous; leaves unpaired-pinnate or occasionally pinnately 3-foliolate, glossy, glabrous, or sometimes the rachis puberulous; leaflets alternate, cuneate-obovate or almost obliquely rhomboid, shortly petioluled, blunt or bluntish acuminate, 1-1½ in. long, coriaceous; flowers rather large, white, in dense but small almost sessile terminal corymbs; petals about ½-¾ in. long, recurved; stamens 10, alternately shorter; ovary 2-celled, the style long with a capitate glandular stigma; berries ovoid-oblong, bluntish acuminate, nearly ½ in. long, orange-coloured, 1-2-seeded; seeds villous.

Hab.—Common in the tropical forests of the Pegu Yomah and Martaban down to Tenasserim; also on the Andamans.—Fl. H.S.; Fr. May-June.—s.—SS.=*SiS.*, Metam., etc.

Remarks.—Furnishes the Burmese box-wood, which is white, heavy, and close-grained; used for handles.

2. **M. Kœnigii,** Spreng; H.f. Ind. Fl. i. 503; Bedd. Sylv. Madr. 44, t. 7, f. 2; Brand. For. Fl. 48.—An evergreen tree (15—20 + 4—10 + ½-1½), glabrous or slightly puberulous; leaves unpaired-pinnate, the rachis usually more or less pubescent, rarely quite glabrous; leaflets in 5-10 pairs with an odd one, on a short puberulous petiolule, oblong-lanceolate or ovate, almost falcate, oblique at base, about 1-1½ in. long, acuminate, more or less serrulate, membranous, glabrous, except on the midrib, which is often puberulous; flowers small, white, in terminal corymbs; petals oblong-lanceolate, acute, about 2-3 lin. long; stamens 10, alter-

nately shorter ; ovary 2 celled, the style short and thick ; berries oblong, somewhat acute, the size of a small pea, 1-2-seeded, bluish-black.

HAB.—Rather frequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah ; also in Chittagong.—Fl. March.—s.—SS.=SiS.

3. **M. elongata,** DC. ; H.f. Ind. Fl. i. 503.—A shrub or tree(?), the bark pale-yellow ; leaves pinnately 4-6-foliolate, glabrous, the petiole with rachis 3 in. long, angular ; leaflets 4-5 in. long, ovate or elliptically lanceolate, bluntish and notchedly caudate-acuminate, coriaceous, pale bright-brown in a dried state ; berries ¾ in. long, narrowly ellipsoid. (From Hooker's Fl. Ind.)

HAB.—Ava.

LUVUNGA, Ham.

Calyx cupular, almost entire or 4-6-lobed. Petals 4 or 5, imbricate. Stamens 8-10, equal or nearly so, free or united at base ; anthers linear or linear-oblong. Disk raised, annular or cupular. Ovary 2-4-celled, with 2 superposed ovules in each cell ; style continuous, rather thick, deciduous ; the stigma capitate. Berry 1-3-seeded, with a thick leathery skin. Testa of seeds membranous.—Scandent, usually armed shrubs, with 3-foliolate leaves. Flowers rather large, forming axillary inflorescences.

1. **L. scandens,** Ham.; H.f. Ind. Fl. i. 509.—A powerful scandent shrub, armed with axillary solitary strong sharp and more or less recurved thorns, all parts glabrous ; leaves 3-foliolate, long-petioled, glabrous ; leaflets lanceolate or oblong-lanceolate, shortly petioluled, more or less acuminate, entire, coriaceous, 3-10 in. long ; flowers conspicuous, white, shortly pediceled, forming glabrous cymose racemes in the axils of the leaves and above the scars of the fallen ones ; petals about 5-6 lin. long ; filaments glabrous, united into a longer or shorter tube ; berries oval, obscurely 3-lobed, the size of a pigeon's egg, rather smooth, 1-3-seeded, glabrous.

HAB.—Burma ; Chittagong.—Fl. H.S. ; Fr. Oct.-Sept.

TRIPHASIA, Lour.

Calyx 3-lobed. Petals 3, imbricate. Stamens 6, free ; the filaments dilated at the base ; anthers linear. Disk fleshy, annular or stalk-like. Ovary 3-celled, with a solitary ovule in each cell, tapering in a slender but deciduous style. Berry pulpy, by abortion 1-2-seeded. Testa of seeds coriaceous.—A thorny shrub with alternate 3-foliolate leaves. Flowers small, axillary, solitary or shortly cymose.

1. **T. trifoliata,** DC. ; H.f. Ind. Fl. i. 507.—A glabrous evergreen shrub, about 5-6 ft. high, armed with sharp thin spines, one at each side of the petiole or on the branchlets; leaves small, on a hardly 2 lin. long petiole, 3- or occasionally 1-2-foliolate ; leaflets obovate or oblong, very shortly petioluled, notched, crenate-toothed, membranous, ½-1 in. long, glabrous, conspicuously dotted; flowers middling-sized, white, fragrant, solitary or in short cymes in the axils of the leaves; petals about 5 lin. long; berries the size of a pea, globular or depressed globular, glossy, crimson.

Hab.—Tenasserim, apparently only cultivated.—Fl. Fr. ∞.

LIMONIA, L.

Calyx 5-lobed or parted. Petals 4-5, imbricate. Disk annular or stalk-like. Stamens 8 to 10, free ; the filaments subulate ; anthers cordate or linear-oblong. Ovary 4-5-celled, with a solitary ovule in each cell ; style rather short and thick, deciduous. Berry globose, 1-4-seeded. Seed enveloped in pulp.—Small trees or shrubs, often spiny, with alternate unpaired-pinnate leaves, the rachis more or less winged. Flowers in fascicles or racemes.

Spiny little tree ; leaflets opposite ; inflorescence puberulous . *L. acidissima.*
Unarmed slender shrub ; leaflets alternate ; inflorescence glabrous *L. alternans.*

1. **L. acidissima,** L.; H.f. Ind. Fl. i. 507 ; Bedd. Sylv. Madr. 45, t. 7, f. 3; Brand. For. Fl. 47.—*Thee-haya-za.*—A little tree, 20 to 25 ft. high, armed with sharp prickles at both sides of the petioles, the younger parts more or less puberulous ; leaves unpaired-pinnate, the rachis broadly leafy-winged ; leaflets in 2-4 pairs with an odd one, opposite, oblong or oblong-lanceolate, almost sessile, notched or blunt, glabrous or along the nerves on both sides or rarely the whole under-surface puberulous, conspicuously pellucid-dotted ; flowers rather small, white, in short (usually solitary or paired) sometimes leafy racemes or poor lax cymes arising from above the scars of the fallen leaves ; petals 4, elliptically oblong, about 2½ lin. long ; stamens 8 ; ovary 4-celled, the style rather long and thick ; berries globular, the size of a small pea, 1-4-seeded, bluish-black.

Hab.—Ava, apparently frequent ; also in Prome District.—Fl. H. S. ; Fr. R. S.

2. **L. alternans,** Wall ; H.f. Ind. Fl. i. 508.—A slender simple or rarely branched unarmed shrub, shedding leaves in HS., 2-4 ft. high, all parts quite glabrous ; leaves unpaired-pinnate, the rachis narrowly winged ; leaflets in 5-7 pairs with an odd one, alternating, oblong-lanceolate to lanceolate, almost sessile, oblique, acuminate, 1-1½ in. long, crenate, glabrous, pellucid-dotted ; flowers 5-merous, appearing with the young leaves, small, white, forming short glabrous shortly peduncled or almost sessile cymes on short axillary branchlets and axillary ; calyx-lobes 3-gonous-oblong, acute, ½ lin.

long; petals 3 lin. long, rather acute; stamens 10, alternately shorter; ovary obovate, smooth, 2-celled, the torus elongating after flowering; berries ovoid, shortly stalked, about 2 lin. long, smooth.

Hab.—Not unfrequent in the upper mixed and occasionally in the moist forests of the Pegu Yomah, sporadical but usually gregarious.—Fl. May.—l.—SS.—SiS.

PARAMIGNYA, Wight.

Calyx cupular or small, 3-5-lobed or -toothed. Petals 4-5, free, imbricate or rarely induplicate-valved. Stamens 8-10, rarely more, free; filaments linear; anthers linear-oblong to oblong. Disk thick and stalk-like. Ovary 3-5-celled, with 1 or 2 ovules in each cell; style often elongate, deciduous. Berry with a thick leathery skin, 1-5-celled and -seeded. Testa of seeds usually membranous. Armed or unarmed trees or shrubs, often scandent, with simple entire leaves. Flowers middling-sized or small, axillary, solitary, clustered or in racemes or short panicles.

* Petals about 8 lin. long. Calyx largish, cupular, broadly lobed.
Style elongate; calyx and pedicels tomentose, the latter as long or a little longer than the calyx . . . . . *P. monophylla.*
Style short; calyx and the pedicels glabrous, the latter 1 in. or thereabouts long . . . . . *P. grandiflora.*
* * Petals 2-4 lin. long. Calyx small, with acute lobes.
○ Berries terete.
Young shoots more or less puberulous; style short, hirsute or villous . . . . . *P. Griffithii.*
Glabrous; style very short, like the ovary glabrous . . . *P. citrifolia.*
○ ○ Berries 3-4-angular.
Erect tree, the spines 1-1½ in. long, straight; calyx glabrous . *P. angulata.*

1. **P. monophylla,** Wight; H.f. Ind. Fl. i. 510.—A scandent evergreen shrub, usually armed with 8 to 10 lin. long axillary recurved spines; leaves elliptically oblong, oval or oblong, usually shortly acuminate, sometimes rounded or blunt, entire or obscurely crenate, glabrous or beneath on the midrib pubescent, 2½-4 in. long; flowers solitary or by 2-4, on 2-4 (-6) lin. long tomentose pedicels, axillary; calyx cup-shaped, broadly 5-lobed, the lobes rounded or square, entire, notched or retuse; petals oblong, 6-8 lin. long, imbricate; stamens 10 (or 12); filaments pilose; ovary pilose; berries "ovate pear-shaped or obovate, pubescent or almost glabrous."

Hab.—Tenasserim, at 5,000 ft. elevation (according to Oliver).

2. **P. grandiflora,** Oliv.; H.f. Ind. Fl. i. 510.—A small tree, armed with very short almost straight spines or nearly unarmed, the softer parts puberulous; leaves ovate-oblong to elliptically oblong, on a puberulous rather slender jointed petiole 3 to 8 lin. long, bluntish apiculate, 2½-3 in. long, sparingly pubescent beneath and glabrescent; flowers large, usually solitary, on an 8-12 lin. long glabrous pedicel,

axillary; calyx glabrous, the lobes broad and rounded, ciliate; petals obovate-oblong, about 8 lin. long or longer; stamens 10; the filaments free and villous; ovary 5-celled, the style very long, villous towards the base.

Hab.—Tenasserim.—Fl. Aug.

3. **P. Griffithii,** H.f. Ind. Fl. i. 510.—An evergreen large scandent shrub, armed with sharp somewhat curved spines, the younger parts pubescent or puberulous; leaves oblong to elliptical, abruptly and bluntish acuminate to apiculate, on a slender puberulous or glabrous petiole 2-4 lin. long, 3-5 in. long, chartaceous or thin coriaceous, glabrous or while young puberulous beneath; flowers rather small, white, on short puberulous pedicels, by 1-3 in the axils of the leaves; calyx small, puberulous, 5-toothed; petals about 3-4 lin. long; ovary and the long style pubescent; berries ovate, glabrous, the size of a cherry, terete.

Hab.—Ava and Pegu.

4. **P. citrifolia,** H.f. Ind. Fl. i. 510.—A much-branched rigid scandent shrub, well armed with short curved spines, all parts glabrous; leaves elliptical to elliptically oblong, 4-5 in. long, shortly petioled, bluntish acuminate, glabrous; flowers small, white, on 2-3 lin. long puberulous or glabrous pedicels, solitary or forming poor clusters in the axils of the leaves; calyx shortly 5-toothed; petals oblong, about 3-4 lin. long; stamens 10, the filaments free, glabrous; ovary glabrous, tapering in a short glabrous style; berries ovoid, as large as a lime, yellow, containing 1-4 oblong seeds.

Hab.—In the tropical forests of the Andamans; also in Chittagong.—Fl. June-July.—s: l.

5. **P. angulata,** (*P. longispina,* H.f. Ind. Fl. i. 511).—A small rigid tree, fearfully armed with ½-1½ in. long sharp cylindrical thorns arising on each side of the petioles, all parts glabrous; leaves elliptical to elliptically oblong, on a glabrous petiole 2-3 lin. long, acute or blunt, 3-4 in. long, glabrous, coriaceous; flowers small, white, fragrant, on very short, glabrous pedicels, solitary or by 2-3 in the axils of the leaves; calyx small, 5-toothed, glabrous; berries ovate, the size of a plum, 3-5-lobed-angular, acuminate, glabrous, seated on the very short torus.

Hab.—In the tidal and mangrove forests of Lower Pegu and Upper Tenasserim.—Fr. Apr.-May.—SS.—Sal.

Remarks.—Wood white, close-grained.

ATLANTIA, Corr.

Calyx 3-5-lobed or -parted, or irregularly splitting. Petals 3-5, free or adnate to the stamens and united with them into a tube,

imbricate. Stamens 6-8, rarely 15-20, inserted round an annular or cup-shaped disk; filaments usually irregularly connate or rarely free; anthers short, ovate or cordate-oblong. Ovary 2- or 4- rarely 3-5-celled, with a solitary or 2 collateral ovules in each cell; style deciduous, with a capitate stigma. Berry almost globular, with a leathery rind, pulpy inside. Seeds oblong, the cotyledons plano-convex, fleshy.—Unarmed or more usually spiny shrubs or trees, with simple leaves. Flowers axillary or terminal, fascicled or solitary, or in cymes or racemes.

× Calyx irregularly lobed, split to the base on one side.
Berries the size of a large pea or small cherry . . . . *A. monophylla.*
Berries the size of a wood-apple . . . . . *A. macrophylla.*
× × Calyx regularly 4-lobed; flowers in short racemes . . *A. caudata.*

1. **A. monophylla**, Corr.; H.f. Ind. Fl. i. 511; Bedd. Fl. Sylv. 44.—A large evergreen shrub, growing out into a small tree, sometimes unarmed, but more frequently armed with solitary axillary, very strong and sharp spines, the young shoots often puberulous; vark pretty smooth, of a greenish ash colour; leaves from oblong to lanceolate- and ovate-oblong, very variable in size, 1-2 in. long and longer, on a puberulous or glabrous petiole 2-3 lin. long, notched, coriaceous, glabrous, or puberulous along the midrib beneath; flowers rather small, white, on about an in. long, slender, usually puberulous but soon glabrescent pedicels, forming short racemes or cymes in the axils of the leaves; calyx deeply 2-3-cleft, the lobes entire and somewhat scarious, or one of them again 2-lobed, glabrous or sparingly puberulous; petals about 4-5 lin. long; stamens usually 10, the broad glabrous filaments united in a long tube; anthers cordate-ovate; ovary glabrous, 4- rarely 3- or 5-celled with one or 2 ovules in each cell; berries globose, the size of a bullet, yellowish, glabrous, often 4-seeded.

Hab.—Ava.—Fl. Octob.-Nov.; Fr. Febr. SS. = Ca. (?)

Remarks.—Wood heavy, hard, white or yellowish, very fine and close-grained. A sort of box-wood; suitable also for cabinet work and for turning.

2. **A macrophylla**, Kz.—An evergreen tree, 25-30 ft. high, all parts glabrous, almost unarmed; leaves ovate to ovate-oblong and almost rhomboid-ovate, on a 2 lin. long petiole, notched, 1½-3 in. long, coriaceous, glabrous; flowers shortly racemose, axillary, the pedicels in deflorate ones 3 to 8 lin. long, very stiff; berries globose, the size of a wood-apple, glabrous.

Hab.—Frequent in the beach forests of the Andamans; also Tenasserim. Fr. Apr.-May.—l.—SS. = Aren.

CITRUS, L.

Calyx cup-shaped or urceolate, 3-5-cleft. Petals 4-8, imbricate. Stamens from 4 to 60; the filaments free or variously united or

polyadelphous; anthers oblong. Disk large, cup-shaped or annular. Ovary many-celled, with 4 to 8 biseriate ovules in each cell; style terete, deciduous; stigma capitate or lobed. Berry leathery-skinned, many-celled, with thin membranous dissepiments, the cells more or less filled with tranverse pulpy cells. Testa of seeds almost membranous, containing sometimes 2 or more embryos. Albumen none.—Trees or shrubs, usually armed, with 1-foliolate, entire or crenate leaves, the petioles often winged. Flowers small or middling-sized, axillary, solitary, or in clusters or short panicles. Berries often large.

× Young shoots and nerves of the leaves beneath pubescent or puberulous; flowers large . . . . . *C. decumana.*
× × All parts glabrous.
○ Style very short.
Flowers small; stamens 4 or 5, free; petioles leaf-like expanded . *C. Hystrix.*
○ ○ Style as long as the ovary or longer.
† Petals 8-10 lin. long.
Leaves acuminate or acute; berries globose, without a knob; filaments cohering by 3-4 . . . . . *C. aurantium.*
Leaves blunt or nearly so; berries oblong, rarely globose, with a knob; the skin usually thick; filaments free or polyadelphous. *C. medica.*
† † Petals 3-4 lin. long.
Calyx small; berries globose, sweet or acid, the skin usually thin . *C. nobilis.*

1. **C. decumana,** L.; H.f. Ind. Fl. i. 516; Brand. For. Fl. 55. —*Shouk-ton-oh.*—An evergreen tree (25—30 + 8—15 + 3—4), the branches more or less armed with axillary straight thorns shorter than the petioles, the younger parts all pubescent or puberulous; leaves oblong or ovate-oblong, about 2-4 in. long, blunt or acute, more or less crenate, glabrous except the pubescent midrib beneath, glossy above; petioles of the lower leaves often short and not winged, the upper ones all jointed and leaf-like winged; flowers rather large, white, forming short pubescent or puberulous racemes; style thick, longer than the pubescent ovary; berries drooping, as large as a man's head, globose or nearly so, filled with rosy or greenish-white loose sweet or somewhat bitter large vesicles; skin 1-1½ in. thick and thicker, green or yellowish outside, spongy and pure white within.

Hab.—Frequently cultivated all over Burma, especially in the southern provinces.—Fl. Febr.-March; Fr. Sept.-Nov.

2. **C. Hystrix,** DC.; H.f. Ind. Fl. i. 515.—*Shouk-pote.*—A small shrubby tree or much-branched shrub, armed with longer or shorter straight axillary solitary spines, all parts glabrous; leaves oval or ovate, 1½-2 rarely 3 in. long, usually blunt or retuse, almost entire or crenate, glabrous; petiole 1-1½, often 2-3 in. long, leafli. expanded and often larger than the blade itself, obversely cordate or obovate-oblong, at base contracted in a simple petiole; flowers 4- or 5-merous, small, white, on very short glabrous pedicels, form-

ing small clusters in the axils of the leaves or sometimes almost solitary; calyx small; petals about 3 lin. long; stamens numerous; ovary obovate, terminated by a very short thick style; berries obovate or irregularly globose, the size of a citroon or larger, very uneven and warty, almost juiceless, with a thick yellow skin.

HAB.—Not unfrequent in the tropical forests of the Martaban hills east of Sittang; also on the hills of Upper Tenasserim. Often cultivated in native gardens.—s.—SS.= Metam?

3. **C. aurantium,** L.; H.f. Ind. Fl. i. 515; Brand. For. Fl. 53.—An evergreen tree (25—30+8—10+3—4), armed with short straight axillary spines, all parts glabrous; leaves ovate- to oblong-lanceolate, acuminate, $2\frac{1}{2}$-$3\frac{1}{2}$ in. long, crenate-toothed or almost entire, glabrous; petiole 4-6 lin. long, narrowly winged; flowers rather large, by 2 or more in the axils of the leaves, white, fragrant; calyx large, broadly 5-toothed; petals 5, oval-oblong, 8-10 lin. long; stamens about 20-40, free or slightly coherent; ovary globose, terminated by a very long thick style; berries large, globose or spheroid, orange-coloured, with a thick somewhat wrinkled skin usually easily separable, the cells filled with vesicular sweet, btiter, or acid pulp.

HAB.—Rarely cultivated in villages.—Fr. C.S.

4. **C. medica,** L.; H.f. Ind. Fl. i. 514; Brand. For. Fl. 51.—*Shouk-ta-kwah.*—A large much-branched evergreen shrub or small tree, usually much armed with shorter or longer axillary straight thorns often longer than the petioles, all parts glabrous; leaves oblong or sometimes obovate, blunt or acute, variable in size, but usually 2-4 in. long, more or less crenate, glabrous, the petioles very short and slender, not or slightly winged or bordered; flowers large, white, usually tinged with purple, usually by 2 or rarely by 3 or solitary in the axils of the leaves, on a very short and often quite reduced peduncle; petals 5, oval-oblong, 8-10 in. long; stamens about 30-50, the filaments free or polyadelphous; ovary with a long thick style; berries obovoid or oblong, terminated by a knob, with a coarse wrinkled citroon-coloured skin, the vesicular pulp greenish or yellowish, acid.

HAB.—Cultivated in villages.—Fl. H.S.; Fr. R.S.—SS.=SiS.

REMARKS.—Wood rather heavy, fibrous, but close-grained, soft, white.

5. **C. nobilis,** Lour. (*C. medica* var. *limetta*; H.f. Ind. Fl. i. 515).—A small slender evergreen tree, 15 to 25 ft. high, rarely a shrub, more or less armed with very small axillary straight thorns, all parts glabrous; leaves small, oblong, or elliptically oblong to oval and oblong-lanceolate, about 2-4 in. long, acute or blunt, more or less crenate, glabrous, the petiole rather short, but slender, very

narrowly or rarely broadly winged; flowers small, white, usually solitary, shortly pedicelled; calyx small; petals 5, oval-oblong, 3-4 lin. long; ovary globular with a thick rather long style; berries rather small, from 1-3 in. in diameter, globose to oblong, with a sweet acid or bitter vesicular pulp, the skin nearly smooth and usually thin, orange-coloured or yellow.

Hab.—Very much cultivated all over Burma.—Fl. H.S.; Fr. R.S.

Remarks.—Wood heavy, yellow, of an unequal coarse fibre, but close-grained, rather hard.

FERONIA, Corr.

Flowers by abortion polygamous. Calyx deciduous, 5-toothed. Petals 5 (rarely 4 or 6), imbricate. Stamens 10-12, some of them usually imperfect; filaments dilated at base; anthers linear-oblong. Torus short. Ovary 5-6-celled, finally 1-celled, with numerous ovules in several rows along the parietal placentas. Berry globose, with a woody rind, 1-celled, many-seeded. Seeds immersed in a fleshy edible pulp.—Armed trees with unpaired-pinnate leaves. Flowers white, loosely racemose or panicled.

1. **F. Elephantum,** Corr.; H.f. Ind. Fl. i. 516; Bedd. Sylv. Madr. 121; Brand. For. Fl. 56.—*Mahan.*—A leaf-shedding tree (25—30 + 8—10 + 2—3), armed with short straight infra-axillary spines, all parts glabrous; leaves unpaired-pinnate, the rachis slightly or almost not winged; leaflets in 2 or 3 pairs with an odd one, nearly sessile, obovate, sometimes cuneate at base, blunt or retuse, about 1-1¼ in. long, obscurely crenate or almost entire, coriaceous, glabrous, glossy above; flowers small, greenish-white, on slender pedicels, forming short terminal or axillary lax racemes or poor panicles; petals about 3-4 lin. long; stamens usually 10, unequal; berries woody, globose, about 1½-2 in. in diameter, one-celled, the numerous seeds immersed in a fleshy edible pulp.

Hab.—Prome district, dry forests (?)—Fl. March-Apr.; Fr. Octob.—l.

Remarks.—Wood yellowish-white, rather heavy, rather coarsely fibrous, but close-grained, hard, takes a fine polish. Yields a gum, like gum arabic. Lac is also obtained from it.

ÆGLE, Corr.

Flowers hermaphrodite. Calyx 4- or 5-toothed, deciduous. Petals 4 or 5, imbricate. Stamens numerous; filaments short, subulate; anthers elongate. Disk inconspicuous. Ovary 8-15-celled, with numerous ovules in two series along the placentas, narrowed in a short style. Berry woody, 8-15-celled, the cells many-seeded and filled with mucous pulp. Testa of seeds woolly-mucous.—Armed trees, with 3-foliolate leaves. Flowers rather large, in racemes or panicles.

1. **Æ. marmelos,** Corr.—H.f. Ind. Fl. i. 516; Bedd. Sylv. Madr. t. 141; Brand. For. Fl. 57.—*Ope-sheet* or *ok-shit.*—A leaf-shedding tree (30—40 + 10—15 + 3—4), armed with axillary strong paired or sometimes solitary spines, rarely quite unarmed, the younger parts slightly puberulous; bark greyish, about ½ in. thick, rather smooth, finally peeling off in small irregular corky flakes; leaves 3-foliolate, the rachis terete; leaflets oblong, broadly lanceolate, acute or bluntish acuminate, crenulate, soon quite glabrous, the lateral ones smaller and shortly petioluled or almost sessile, the terminal one much larger and on a rather long petiolule; flowers rather large, white, on slender pedicels, forming lax poor terminal or lateral puberulous racemes; calyx pubescent; petals about 4-5 lin. long; berries woody, as large as an apple, almost globose, oblong, or slightly pear-shaped, smooth, 10-15-celled, each cell containing 6-10 oblong woolly seeds imbedded in a tenacious slimy edible pulp.

Hab.—Much cultivated, especially in the Prome district, and said to occur also wild in the forests.—Fl. May; Fr. October-Nov.—l.

Remarks.—Wood light-coloured, usually uniformly yellowish-white, or variegated with veins, heavy, very close-grained, compact, hard and very strong, takes a beautiful polish. The fruits are much liked by the Burmese and others.

SIMARUBEÆ.

Flowers regular, dioecious, or polygamous, rarely hermaphrodite. Calyx gamosepalous, or 3-5-sepalled. Petals 3-5, hypogynous or slightly perigynous, imbricate or valvate, rarely wanting. Stamens as many or twice as many; anthers versatile, the cells opening by longitudinal slits. Disk under or round the ovary, various, rarely wanting. Ovary of 3-5, rarely more or fewer, carpels either quite distinct or more or less united into a lobed or rarely entire ovary, with a solitary or rarely 2 ovules in each cell; styles as many as carpels, free or united at the base or with their stigmas only. Fruiting carpels either distinct, dry or drupaceous and usually indehiscent, or united in an entire or lobed drupe or capsule. Seeds pendulous, the testa membranous. Albumen abundant, little or none.—Trees or shrubs, with pinnate or simple leaves, usually not gland-dotted. Flowers small, in terminal or more frequently in axillary panicles or racemes.

All species are intensely bitter. The seeds of the central American cedron tree (*Simaba cedron*) form a renowned antidote against snake-bite. The following are all the Burmese species of this order known to me.

* The carpels quite distinct or only at base connate.
○ Stamens twice as many as petals, rarely more.

Leaves simple . . . . . *Samadera.*
Leaves pinnate . . . . . *Ailanthus.*

○ ○ Stamens as many as petals. Leaves pinnate.
† Disk present.
Disk thick; stamens pilose; flowers panicled . . . . *Picrasma.*
Disk 4-lobed; stamens glabrous; flowers in racemes . . . *Brucea.*
† † Disk none; flowers in panicles . . . . *Eurycoma.*
∗ ∗ Ovary entire or lobed, 2-5-celled.
Filaments with a basal 2-cleft scale; leaves 1-3-foliolate or pinnate . . . . . *Harrisonia.*
Filaments without scale; leaves 2-foliolate . . . . . *Balanites.*

SAMADERA, Gaertn.

Flowers hermaphrodite. Calyx 3-5-parted, glandular outside at the base, imbricate. Petals 3-5, contorted in bud. Disk large, inverted-conical. Stamens 6-10, included, furnished at base with a short scale. Ovary consisting of 4-5 free lobes, each with a solitary suspended ovule; styles united. Drupes 1-5, large, dry, keel-winged. Testa of seeds membranous.—Evergreen trees with simple entire leaves. Flowers rather large, in poor umbels.

1. **S. Indica,** Gaertn.—H.f. Ind. Fl. i. 519; Bedd. Sylv. Madr. 49.—*Kathai.*—A small evergreen tree, all parts glabrous; leaves oblong to elliptically oblong, 8-10 in. long, acute at base, on a rather short petiole, bluntish acuminate, quite entire, coriaceous, glossy and prominently laxly net-veined on both sides; flowers rather large, yellowish, forming poor terminal glabrous long-peduncled umbels; calyx very short, bluntish 4-toothed; petals 4, about an in. long, oblong, blunt, puberulous; stamens 8; ovary 4-lobed; drupes usually solitary, about 2 in. long, glossy, obliquely obovoid, keel-winged, the wing thick and obliquely excurrent at the summit.

Hab.—Upper Tenasserim, tropical forests.—s.

Remarks.—Yields the niepa bark of commerce.

AILANTHUS, Desf.

Flowers polygamous. Calyx 5-cleft, imbricate. Petals 5, induplicately valvate. Disk 10-lobed. Stamens 10, in the females none, in the hermaphrodites 2-3, the filaments without basal scale. Ovary 2-5 parted (in the males rudimentary), with a solitary ovule in each cell; styles connate; stigmas feathery. Samaras 1-5, winged all round, chartaceous, 1-seeded. Albumen scanty.—Large trees, with pinnate leaves. Flowers small, in terminal panicles.

1. **A. Malabaricus,** DC.; H.f. Ind. Fl. i. 518; Bedd. Fl. Sylv., t. 122; Brand. For. Fl. 58.—A tree 60-80 ft. high, shedding leaves in H.S., the leaf-buds rusty-tomentose; leaves unpaired-pinnate, 1-2½ ft. long, glabrous; leaflets falcate-lanceolate, oblique at base, shortly petioluled, alternate, acuminate, entire, chartaceous, glabrous;

flowers small, on 2 lin. long tawny puberulous pedicels, racemulose, forming fugaceously puberulous rather large terminal panicles; petals nearly 2 lin. long; samaras 1½-2 in. long, oblong, blunt at both ends, veined, brown, 1-seeded in centre.

Hab.—Rather rare in the tropical forests of the Khaboung choung, eastern slopes of Pegu Yomah.—Fr. Apr.—s : l.—SS.=SiS.

Remarks.—Wood soft, white, said to be useless.—Exudes a reddish gum.

PICRASMA, Bl.

Flowers dioecious. Calyx minute, 4-5-toothed. Petals 4 or 5, usually enlarging in the females, valvate. Stamens in males as many as petals, inserted round the thick disk, in the females often wanting, the filaments without basal scale. Ovary of 3-5 distinct lobes, raised on the fleshy disk, with a single ovule in each lobe. Drupes 1-3, small, containing a crustaceous or coriaceous 1-seeded nut. Albumen fleshy.—Evergreen trees, with pinnate leaves. Flowers small, greenish, cymose, in axillary panicles.

1. **P. Javanica,** Bl.; H.f. Ind. Fl. i. 520.—An evergreen tree (40—50 + 10—25 + 4—5), all parts glabrous; leaves unpaired-pinnate, 8-9 in. long, the rachis furnished at base with small rotundate stipules; leaflets in 3 pairs with an odd one, oblong or elliptically oblong, on a 2-3 lin. long petiolule, rounded at base, bluntish apiculate, 4-5 in. long, entire, membranous, beneath silky-shining, laxly net-veined; flowers small, greenish-white, in almost trichotomous cyme-like glabrous axillary panicles shorter than the leaves; calyx 4-cleft, the lobes rotundate, almost acute; petals 4, oblong, rather acute, glabrous; drupes usually by 4 or fewer, globular, raised on the flat and thick torus, white, smooth.

Hab.—Frequent in the tropical forests from Martaban down to Tenasserim and the Andamans; rare in those of the Pegu Yomah.—Fl. March; Fr. Begin. of R.S.—s.—SS.=Metam., &c., SiS. (?)

Remarks.—Wood yellowish-white, amianth-like fibrous, rather light, close-grained, soft, perishable.

BRUCEA, Mill.

Flowers polygamous. Calyx 4-cleft, imbricate. Petals 4, minute, imbricate. Stamens 4, rudimentary in the males; the filaments glabrous. Disk 4-lobed. Ovary of 4 distinct or almost distinct lobes, each with a single pendulous ovule; styles free or only at base connate. Drupes 4 or fewer, each containing a crustaceous one-seeded nut. Testa of seed membranous. Albumen copious.—Shrubs or trees, with pinnate leaves. Flowers minute, in little cymes forming axillary racemes.

Leaflets coarsely crenate-toothed; drupes about 2 lin. long . . . *B. Sumatrana.*
Leaflets quite entire; drupes about 3-4 lin. long . . . . . *B. mollis.*

1. **B. Sumatrana,** Roxb.; H.f. Ind. Fl. i. 521.—A large evergreen shrub, all younger parts softly pubescent; leaves 1-1½ ft. long or longer, unpaired-pinnate; leaflets in 2-3 pairs with an odd one, obtuse and often somewhat oblique at base, ovate-lanceolate, on a short but slender petiolule, 2-2½ in. long, acuminate, coarsely crenate-toothed, densely pubescent or villous, especially beneath; flowers minute, purple, in little cymes or clusters and forming an interrupted tomentose racemes in the axils of the leaves as long or shorter than them; drupes the size of a small pea, glabrous.

Hab.—Tenasserim.

2. **B. mollis,** Wall.; H.f. Ind. Fl. i. 521.—A small simple-stemmed shrub, all younger parts puberulous or pubescent; leaves unpaired-pinnate, the petiole and rachis terete, puberulous and glabrescent; leaflets in 4-6 pairs with an odd one; ovate-oblong or ovate-lanceolate, on a 2-3 lin. long pubescent petiolule, acuminate, quite entire, membranous, above sparingly, beneath more densely pubescent, or (except the pubescent nerves) almost glabrous, 2-3 in. long; flowers minute, green, on slender about a line long pubescent pedicels, forming puberulous or pubescent simple slender racemes in the axils of the leaves and much shorter than them; petals lanceolate, ciliate towards the base; disk green, larger than the sparingly tawny hispid glabrescent ovary; styles broadly linear, deflexed; drupes solitary or by 2, rarely 3, ovate, the size of a large pea or larger.

Hab.—In the drier and damp hill-forests of Martaban and Upper Tenasserim, at 3,000 to 4,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

EURYCOMA, Jack.

Flowers polygamous. Calyx cup-shaped, 5-toothed, imbricate. Petals 5, induplicate-valvate. Disk none. Stamens 5, almost central in the males, hypogynous in the females; the filaments at the base appendaged at each side. Ovary deeply 5-parted, the 1-ovuled lobes free and sessile; styles united. Drupes 3-5, stalked, beaked, crustaceous, dry, when fully ripe tardily dehiscing along the inner angle. Albumen none.—Trees or shrubs, with unpaired-pinnate leaves. Flowers in ample nearly terminal panicles.

1. **E. longifolia,** Jack.; H.f. Ind. Fl. i. 521.—An evergreen shrub or rather treelet, 7 to 10 ft. high, with the trunk usually simple or prolific at the summit, the younger shoots densely rusty-pubescent; leaves unpaired-pinnate, 2-2½ ft. long, glabrous, the petiole and rachis glossy blackish; leaflets in numerous pairs with an odd one, oblong-lanceolate, almost oblique at base, almost sessile, 3-4 in. long, nearly blunt, coriaceous, entire, beneath silvery-glaucous;

flowers about 2 lin. long, slenderly pedicelled, brownish blood-red, forming densely rusty-glandular axillary panicles at the end of the branches and much shorter than the leaves; calyx glandular-pubescent; petals lanceolate, shortly tomentose or velvety; filaments subulate, scarlet, whitish pilose, at base furnished with 2 oblong yellow sessile glands; ovary-carpels pilose.

HAB.—Lower Tenasserim, in forests; also Andamans.—Fl. Nov.

HARRISONIA, R. Br.

Flowers hermaphrodite. Calyx 4-5-cleft. Petals 4-5, almost valvate. Disk hemispherical or cup-shaped. Stamens 8-10, alternately shorter; the filaments furnished with a small 2-cleft scale on each side at the base. Ovary globular, entire or 4-5-lobed and 4-5-celled, with a solitary pendulous ovule in each cell; styles connate or free at base. Drupes globular, containing 2-5 perforated 1-seeded nuts. Albumen scanty.—Shrubs or trees, usually prickly armed, with 1-3-foliolate or pinnate leaves. Flowers small, in axillary cymes.

1. **H. Bennetii**, Bth. and H.f.; H.f. Ind. Fl. i. 519.—*Tapoopen.*—A tree (15—30+ ? +1½—2), leafless in H.S., armed with short straight prickles, all softer parts puberulous; leaves unpaired-pinnate, the puberulous rachis winged; leaflets in 3, rarely 4 pairs, with an odd one, almost sessile, rhomboid-ovate or obliquely ovate-lanceolate, blunt or bluntish-acuminate, 1-1½ in. long, cuneate or acute at base, coarsely crenate or rarely entire, chartaceous, slightly puberulous on both sides, rarely glabrous; flowers rather large, whitish, forming puberulous cymes at the ends of the short lateral branches; petals 5, reddish-white; disk cup-shaped; ovary depressed globular, entire; drupes depressed globular, stylose-apiculate, glabrous.

HAB.—Very frequent in the dry forests of the Prome District; also in Martaban, Yoonzeleen, 2,000 ft.—Fl. Apr.—l.—SS.=CaS., Ca.

BALANITES, Del.

Sepals 5, deciduous, imbricate with their margins. Petals 5, imbricate. Stamens 10; the filaments without basal scales. Disk thick, depressed conical or cushion-like. Ovary globular, half-immersed in the disk, 5-celled, with a solitary pendulous ovule in each cell; style short, subulate. Drupe fleshy, oily, containing a bony 5-angular 1-seeded nut. Albumen none.—Shrubs or little trees, spiny armed, with 2-foliolate leaves. Flowers small, cymose.

1. **B. Roxburghii**, Planch ; H.f. Ind. Fl. i. 522 ; Brand. For. Fl. 59.—A leaf-shedding small tree or large shrub, all softer parts shortly greyish pubescent, armed with large straight very sharp solitary spines frequently bearing leaves and flowers, the trunk much crooked, ash-coloured ; leaves 2-foliolate, on a very short petiole ; leaflets 1-1½ in. long, shortly petioluled, from oval to oblong, acute at base, blunt, while young shortly tomentose ; flowers rather small, greenish-white, shortly pedicelled, forming rather long-peduncled tomentose cymes ; sepals and petals inside tomentose ; drupes as large as a pullet's egg, 5-grooved, with a smooth light-grey dry epicarp, the hard one-seeded nut imbedded in the exceedingly bitter, soap-like, offensively smelling pulp.

Hab.—In the dry forests of Prome and Ava.—Fl. Apr.—l.

OCHNACEÆ.

Flowers hermaphrodite. Sepals 4-5, free, usually scarious, imbricate. Petals 5, rarely 4-10, free, deciduous, almost sessile or clawed, imbricate or convolute. Torus never annular or glandular, enlarged under the fruit. Stamens 4-10 or many, equal or unequal, one-sided or declinate ; filaments persistent ; anthers linear, basifix, dehiscing longitudinally or by terminal pores. Ovary central or excentrical, 1-10-celled, terete or lobed, with 1 or 2 rarely more ovules in each cell, the placentas various ; style simple, or rarely 2-10-cleft at summit. Fruit either consisting of 3 to 10 one-seeded drupes seated on the enlarged torus, or 2-4-lobed, 1-4-seeded, indehiscent, or berry-like, or septicidally capsular, coriaceous or woody. Albumen fleshy or none.—Trees or shrubs, with simple usually serrulate leaves. Stipules present. Flowers showy, often bright yellow, in panicles or fascicled, rarely solitary.

Bitter principles prevail in this small order. Timber of most species good, but small. The five species below are all that are known from Burma.

Stamens numerous ; inflorescence lateral	*Ochna.*
Stamens 10 ; panicles terminal	*Gomphia.*

OCHNA, Schreb.

Sepals 5, persistent, coloured. Petals 5-10, deciduous. Torus thick, lobed or stalk-like raised. Stamens numerous, the filaments filiform. Ovary deeply 3-10-lobed, with a solitary ovule in each lobe. Drupes 3-10, sessile on the enlarged torus. Seeds erect.—Trees or shrubs, with simple serrulate leaves. Stipules axillary, by pairs. Flowers bright yellow, in lateral panicles or corymbs, rarely solitary or fascicled.

* *Styles free at the summit*, fruiting sepals erect-conniving . *O. Andamanica.*
* * *Styles united along the whole length.*
† Trees.
Petals usually 7-8; filaments almost 4 times shorter than the anthers; fruiting sepals erect-conniving . . . . *O. squarrosa.*
Petals 5; filaments as long or longer than the anthers; fruiting sepals reflexed . . . . . *O. Wallichii.*
†† Dwarf shrubs; filaments about as long as the anthers; fruiting sepals erect-connivent.
Bractlets linear, conspicuous; peduncles very long, axillary, 2-3-rarely 1-flowered . . . . . *O. pumila.*
Bractlets none; peduncle none or very reduced, usually corymbosely many-flowered . . . . . *O. fruticulosa.*

1. **O. Andamanica,** Kz.—A small tree, shedding leaves in H.S., all parts glabrous; leaves oblong or oblong-lanceolate, about 4-5 in. long, shortly petioled, acute and mucronate, bristly or minutely serrulate, chartaceous, glossy above; flowers large and showy, bright yellow, appearing with the young leaves, on rather short but slender afterwards elongating pedicels, jointed with the simple very short peduncles which arise from the end of the lateral leafless branchlets; filaments as long or somewhat longer than the anthers; petals 5, somewhat longer than the sepals, obovate, broadly clawed; sepals of the fruiting calyx all erect-connivent; styles all free at the summit and spreading.

Hab.—Rather frequent in the tropical and moister upper mixed forests of the Andamans.—Fl. March; Fr. May-June.—s.—SS. = SiS. Chloritic rocks, etc.

Remarks.—Wood pale-brown, heavy, close-grained, but irregularly fibrous, hard and somewhat brittle, the sapwood paler-coloured.

2. **O. Wallichii,** Planch; H.f. Ind. Fl. i. 524 in part.—*Yo-da-yah.*—A tree (30—50 + 10—25 + 3—5) shedding leaves in H.S., all parts glabrous; bark greyish-brown, 3-4 lin. thick, rather smooth or slightly wrinkled; cut reddish, dry; leaves from elliptically oblong to oblong-lanceolate, about 4-5 in. long, shortly petioled, narrowed at base, acuminate, minutely but sharply serrulate, chartaceous, glossy above; flowers appearing with the young leaves, large, bright-yellow, on very long slender pedicels, arising either from very short simple or from longer branched peduncles at the end of the longer or shorter leafless branchlets; petals about 5, about twice as long as the sepals, obovate, narrowed into a broad claw; filaments as long or somewhat longer than the anthers; sepals of the fruiting calyx all reflexed; styles about an inch long, the stigmas depressed-capitate.

Hab.—Very frequent in the tropical forests of Martaban and Tenasserim; less so along the eastern and southern slopes of the Pegu Yomah.—Fl. March; Fr. Apr.-May.—SS. = *Metam.* SiS., Lat. p.

Remarks.—Wood brown, heavy, close-grained, of a flexuose fibre, brittle.

3. **O. squarrosa,** Roxb.; H.f. Ind. Fl. i. 523 in part only; Bedd. Sylv. Madr. 50, t. 8, f. 3; Brand. For. Fl. 60.—A small

leaf-shedding tree, all parts glabrous; leaves oblong or ovate-oblong, shortly petioled, blunt or acute, sharply serrulate; flowers rather large, corymbose; petals usually 7 to 8, obovate-oblong; filaments almost 4 times shorter than the anthers; styles connate; sepals of the fruiting calyx erect-connivent.

Hab.—Prome; Tenasserim (?)—Fl. H.S.

4. **O. fruticulosa,** Kz.—A stunted dwarfy shrub, with strong developed underground trunk, 1 to 3 ft. high, leafless in H.S., all parts glabrous; leaves usually cuneate-oblong or cuneate-lanceolate, about 4-5 in. long, acuminate to almost bluntish, at base narrowed into a very short petiole, chartaceous, sharply serrulate; flowers showy, bright yellow, appearing along with, or before, the young leaves, on longer or shorter pedicels, arising either direct from the short lateral branchlets, or usually from short simple or branched peduncles; petals 5, obovate, clawed; filaments as long as the anthers; style as long or somewhat longer than the sepals, very slender, filiform; stigma minute, truncate; sepals of the fruiting calyx erect connivent.

Hab.—Frequent in the open forests, especially the Eng-forests, all over Pegu and Martaban.—Fl. Apr.-May; Fr. June-July.—I.—SS. = *Dil.* Arg.

GOMPHIA, Schreb.

Sepals 5, persistent or deciduous, usually coloured. Petals 5, imbricate. Torus thick, lobed or stalk-like. Stamens 10, the filaments very short; anthers opening by pores. Ovary deeply 5-6-parted, the lobes inserted obliquely on the torus, with a solitary ascending ovule in each cell; styles connate. Drupes 5 or fewer by abortion, sessile on the enlarged torus. Seeds erect.—Trees or shrubs, with simple serrate leaves. Stipules usually connate. Flowers yellow or orange-yellow, in terminal panicles.

1. **G. Sumatrana,** Jack.; H.f. Ind. Fl. i. 525.—A little evergreen tree, all parts glabrous; leaves lanceolate to elliptically oblong, shortly petioled, acuminate, bluntish serrate, 3-5 in. long, obtuse or acute at base, chartaceous, glabrous; flowers rather small, deep-yellow, on long slender pedicels, in terminal and axillary short raceme-like panicles arranged in a larger panicle at the end of the branches; sepals about 3 lin. long; torus in fruit large, fleshy, deep-crimson; drupes as large as a pepper-kernel or larger, glabrous.

Hab.—Tenasserim, along the sea-coast.

BURSERACEÆ.

Flowers hermaphrodite or polygamous, regular. Calyx gamosepalous, or the sepals distinct, imbricate or valvate. Petals 3-5,

usually free, deciduous, valvate or imbricate. Stamens twice as many as petals or more, rarely 3-5, equal or unequal, free; anthers usually versatile. Disk usually conspicuous, annular or cup-shaped. Ovary free, 2-5-celled, with 2 or rarely a solitary usually pendulous ovule in each cell; style usually short, with an entire or 2-5-lobed stigma. Drupe indehiscent, containing 2-5 nuts or a bony or chartaceous stone, the fruit rarely capsular, enclosing 2-5 bony nuts. Seeds pendulous. Albumen none.—Trees or shrubs, with pinnate or rarely 3-1-foliolate leaves, the lower pair of leaflets usually stipule-like. Flowers small, in racemes or panicles.

This order contains trees yielding myrrh and frankincense, and all the species abound in fragrant resins. Their timber is usually heavy and durable. All the Burmese species are trees.

Disk covering the whole urceolate calyx-tube, produced into appendaged lobes; calyx large, bell-shaped . . . . . *Garuga.*
Disk annular; calyx minute, imbricate, 4-6-parted . . . *Bursera.*
Disk annular, or consisting of free glands; calyx rather large, valvate, usually 3 (rarely 2-5) -cleft . . . . . *Canarium.*

GARUGA, Roxb.

Flowers polygamous. Calyx bell-shaped, 5-cleft, valvate. Petals 5, inserted above the middle of the calyx-tube, induplicate-valvate. Disk thin, fleshy, 5-cleft, the lobes closely adhering to the calyx and terminating in a bluntish appendage almost glandular-notched. Stamens 10, free, equal. Ovary 4-5-celled, with 2 ovules in each cell; the style thick with a capitately 4-5-lobed stigma. Drupes fleshy, containing 5 or by abortion 1-3 bony 1-seeded nuts.—Trees, with unpaired-pinnate leaves, the leaflets crenate or serrate. Flowers comparatively rather large, in terminal panicles.

1. **G. pinnata,** Roxb.; H.f. Ind. Fl. i. 528; Bedd. Sylv. Madr. t. 108; Brand. For. Fl. 62, t. 13.—*Chin-yop-pen.*—A tree (70—80 + 40—50 + 6—7), leafless during H.S., all younger parts tomentose; leaves unpaired-pinnate, tomentose or pubescent, often turning glabrous; leaflets in about 9-7 pairs with an odd one, very shortly petioluled or almost sessile, oblong-lanceolate, about 3-5 in. long or longer, acuminate, crenate-serrate; flowers cream-coloured, on slender but short pedicels, forming numerous terminal branched panicles shorter than the leaves; drupes irregularly globose, as large as a cherry, yellowish-green, fleshy, glabrous or pubescent, containing from 1 to 5 one-seeded nuts.

Hab.—Common in the mixed forests all over Burma from Chittagong and Ava down to Tenasserim and the Andamans, up to 3,000 ft. elevation.—Fl. Febr.-March; Fr. Begin. of R.S.—l.—SS. = ∞.

Remarks.—Wood greyish or yellowish, rather heavy, coarsely fibrous, but rather close-grained, takes an indifferent polish, and is not much used. □' = 52 pd. Bark good for tanning.—Exudes a gum. The leaves are frequently invested with large red obovate apiculate galls.

BURSERA, L.

Flowers hermaphrodite or polygamous. Calyx small, 4-6-parted or -lobed, imbricate. Petals as many, valvate or rarely imbricate. Stamens 8-12, nearly equal. Disk annular, crenate. Ovary 3-5-celled, with 2 ovules in each cell; style very short, with a 3-5-lobed stigma. Drupes indehiscent or rarely 2-3-valved, containing usually one, rarely more, one-seeded bony nuts.—Resinous trees, with unpaired leaves. Flowers minute, in axillary panicles or racemes.

1. **B. serrata,** Wall.; H.f. Ind. Fl. i. 530.—*Thadee pen.*—An evergreen tree (80—90 + 30—50 + 6—8), sometimes shedding leaves in H.S., the younger parts pubescent; leaves unpaired-pinnate, pubescent or tomentose while young; leaflets in 3 to 5 pairs with an odd one, on rather long and slender petiolules, bluntish cuspidate, while young usually quite entire, when full grown more or less serrate and quite glabrous; flowers minute, yellowish-green or greenish-white, very shortly pedicelled, forming axillary, solitary, looes and elongate panicles shorter than the leaves; drupes on thickened peduncles, globular, sometimes obscurely 2-3-lobed, as large as a small cherry, red, containing 1 to 3 one-seeded nuts.

Hab.—Frequent in the tropical forests, especially along choungs, of the eastern slopes of the Pegu Yomah and Martaban.—Fl. Apr.—s × l.—SS.=Metam. SiS.

Remarks.—Wood brown, turning red-brown, heavy, close-grained, of a somewhat unequal but fine fibre, tolerably soft, takes fine polish. Good for furniture, etc.

CANARIUM, L.

Flowers hermaphrodite or polygamous. Calyx urceolate or cup-shaped, 3- (rarely 2- or 5-) cleft, persistent, valvate. Petals 3-4, rarely 5, valvate or slightly imbricate. Stamens 8-10, inserted on the margin or outer side of a fleshy, entire or lobed disk; filaments usually free. Ovary 3- rarely 3-4-celled, with 2 ovules in each cell; stigma sessile. Drupes often somewhat 3-angled, containing a single bony 1-seeded nut. Testa of seed membranous.—Large resinous trees, with unpaired-pinnate leaves, the lower pinnules sometimes stipule-like. Flowers small or middling-sized, in axillary panicles.

* Stipules subulate, entire, very deciduous.
Leaflets serrulate; disk-glands smooth, free, cohering by pairs . *C. euphyllum.*
Leaflets entire; disk-lobes hairy, united in a cup . . . *C. Bengalense.*
* * Stipules 2-cleft and pectinately cut, persistent . *C. coccineo-bracteatum.*

1. **C. euphyllum,** Kz.; H.f. Ind. Fl. i. 535.—An evergreen tree (80—90 + 50—60 + 10—14); leaves 2-3 ft. long, unpaired-

pinnate, the rachis striate in a dried state; leaflets oblong or ovate-oblong, opposite, 9-10 in. long, obliquely rounded at base, apiculate, on a $\frac{3}{4}$ in. long petiolule, chartaceous, serrulate, glossy, glabrous, much net-veined between the 12-19 lateral nerves on each side, the lower leaflets smaller; flowers rather large, white, in short distant racemes, forming $1\frac{1}{2}$ ft. long quite glabrous axillary panicles shorter than the leaves; calyx 3-cleft, the broad lobes rather blunt; petals 3, lanceolate-acute, rather thick, about $\frac{1}{2}$ in. long, velvety outside; disk-glands cohering by pairs, elliptical, blunt, yellow; stamens 6, the filaments cohering at the base; style simple.

Hab.—Frequent in the tropical forests of South Andaman.—Fl. June.—s.—SS. = SiS. Chloritic rocks.

2. **C. coccineo-bracteatum,** Kz.; H.f. Ind. Fl. i. 536.—A middling-sized evergreen tree, about 50 ft. high, all younger parts tawny velvety; leaves unpaired-pinnate, 1-2 ft. long, glabrous, the rachis striate, pale tawny-coloured; leaflets 3 to 4 pairs with an odd one, 5-7 in. long, opposite, oblong or ovate-oblong, on a 3-4 lin. long petiolule, unequal at the obtuse base, acuminate, entire and bristly serrulate on the same tree, almost coriaceous, glabrous, laxly net-veined between the 10 lateral nerves on each side beneath; stipules rather large, deeply 2-cleft and cut again into several stiff coarsely-toothed segments, pale puberulous; flowers (in bud) forming axillary crimson velvety panicles at the end of the branches; bracts oblong, acute, velvety, bright red.

Hab.—Rather rare in the tropical forests of South Andaman.—Fl. May.—s.—SS. = SiS.

3. **C. Bengalense,** Roxb.; H.f. Ind. Fl. i. 534.—A lofty evergreen tree, the leaf-buds slightly rusty pubescent; leaves unpaired-pinnate, 1-2 ft. long; leaflets almost opposite, in 6-10 pairs with an odd one, lanceolate to oblong-lanceolate, on a 2-3 lin. long petiolule, acuminate, entire, chartaceous, glabrous, 2-4 in. long; stipules entire, subulate, very caducous; flowers middling-sized, white, shortly pedicelled, forming elongate raceme-like panicles in the axils of the leaves and shorter than them; calyx cup-shaped, and broadly 3-toothed; petals obovate-oblong, $\frac{1}{3}$ in. long; filaments united half-way in a tube; disk-scales 3, hairy, united in a cup; drupes oblong, the size of a plum, dark purple, pruinous, containing an obscurely 3-cornered 3-celled bony nut.

Hab.—Very rare in the moister upper mixed forests of the Pegu Yomah.—s.—SS. = SiS.

Remarks.—Wood pale-brown, rather light, coarse-fibrous, but rather close-grained; takes fine polish.—Exudes a clear, brittle, amber-coloured resin resembling copal.

MELIACEÆ.

Flowers regular, usually hermaphrodite, rarely polygamous, dioecious. Calyx usually small, 4- or 5-lobed, or the sepals distinct, imbricate or very rarely valvate. Petals 4 or 5, rarely 5-7 or 3 only, imbricate, contorted or rarely valvate. Stamens 5-20, usually 8-10; the filaments inserted outside on the disk, more or less united in a tube, very rarely quite free; anthers sessile or rarely stipitate, on the inside or at the summit of the staminal tube, 2-celled, the cells opening longitudinally. Disk various, free or adnate. Ovary 3-5-celled, with usually 2, rarely 1 or 6 or more, ovules in each cell; stigma disk-shaped or pyramidal. Fruit a capsule, berry or drupe, indehiscent or opening loculicidally, rarely septicidally. Albumen fleshy or none. Radicle superior.—Trees or shrubs, with alternate usually pinnate leaves. Stipules none. Flowers usually small, in panicles.

Bitter, astringent, and tonic qualities prevail in the order; hence the bark and root of several species are used as febrifuges. The timber of many is valuable, and satin-wood, mahogany, and toon-wood are the produce of trees belonging to this order. All the species of this order are woody, and are therefore described here.

* *Stamens united into a tube or cup.*
○ *Ovules* 2 *or* 1. *Seeds not winged.*
× Albumen thin, fleshy. Cotyledons leafy or plano-convex.
† Capsule loculicidally 5-valved; calyx-lobes leafy . *Munronia.*
† † Fruit a drupe.
Calyx 5-6-parted; drupes containing a single 1-5-celled stone . *Melia.*
Calyx 5-toothed; drupes containing 5 cartilagineous pyrenes . *Cipadessa.*
× × Albumen none. Cotyledons thick, often conferruminate.
† Disk free, tubular or cylindrical; style usually elongate.
+ Leaves pinnate.
Calyx small, toothed, open in bud; seeds without arillus . . *Dysoxylon.*
Calyx usually bell-shaped, toothed, open in bud; arillus complete or incomplete . . . . . *Schizochiton.*
+ + Leaves 3-foliolate; calyx tubular . . *Sandoricum.*
† † Disk none, or annular, stalk-like or confluent with the staminal tube; styles usually short or none.
+ Anthers included or almost included in the staminal tube.
Petals 5; anthers 5-10; berry indehiscent . . . . . *Aglaia.*
Petals 3; anthers 6; capsule loculicidal . . . . . *Amoora.*
+ + Anthers exserted or the filaments free.
Berry indehiscent, or follicular dehiscing, 1-celled; arillus present *Walsura.*
Capsule loculicidal; seeds large; arillus none . . . . *Carapa.*
○ ○ *Ovules many. Seeds winged.*
Disk rather broad; seeds winged at both ends . . . . *Soymida.*
Disk none; seeds winged at the lower end only . . . . *Chickrassia.*
* * *Stamens free; ovules many; seeds winged* . . . . *Cedrela.*

MUNRONIA, Wight.

Calyx persistent, 5-parted, imbricate, the lobes almost leafy. Petals 5, up to the middle united into a funnel-shaped tube. Staminal tube adnate to the corolla-tube, free upwards, 10-toothed at apex; anthers 10, alternating with the teeth and furnished with a bristly appendage. Disk membranous, sheathing the ovary. Ovary 5-celled, with 2 ovules in each cell; style slender. Capsule 5-lobed, loculicidally 5-valved. Albumen thin.—Small undershrubs or shrubs with 3-foliolate or unpaired-pinnate leaves. Flowers large, white, in poor axillary cymes.

1. **M. Wallichii,** Wight; H.f. Ind. Fl. i. 543.—A small simple-stemmed shrub, up to a foot high, the young shoots pubescent; leaves unpaired-pinnate, the petiole and rachis terete and pubescent; leaflets in 2-3 pairs with an odd one, very shortly petioluled, opposite or almost alternate, ovate-lanceolate to lanceolate, 2-2½ in. long, unequal at base, bluntish acuminate, membranous, entire, puberulous on the nerves beneath; flowers about an in. long, showy, white, pedicelled, forming tawny pubescent cymes in the axils of the upper leaves; calyx pubescent, the lobes about 3 l.n. long, oblong-spathulate, somewhat acute; corolla-lobes as long as the tube, pubescent outside, especially along the borders; the teeth of the staminal tube on the back appendaged.

Hab.—On shady moist rocks in the upper mixed forests of the central range of the Pegu Yomah.—Fl. March.-Apr.—s.—SS.= SiS.

MELIA, L.

Calyx 5-6-parted, imbricate. Petals 5 or 6, free, twisted in bud. Staminal tube almost cylindrical, 10- or 12-toothed or -cleft, the lobes 2-3-lobed; anthers 10-12, within the summit of the tube. Disk annular. Ovary 3-6-celled, with 2 superposed ovules in each cell; style slender. Drupe containing a 1-5-celled stone. Seeds pendulous. Albumen thin, fleshy.—Trees, with alternate pinnate to decompound leaves. Flowers often showy, in large axillary panicles.

* *Leaves simply pinnate.*

Leaflets entire . . . . . *M. excelsa.*

Leaflets serrate; drupes small, by abortion 1-celled and 1-seeded . *M. Azadirachta.*

* * *Leaves bipinnate. Drupes 5-celled, some of the cells usually seedless.*

Drupes small, oblong, about ½ in. long; staminal tube blue, slender, glabrous outside, about 3 lin. long; leaflets serrate. . . *M. Azedarach.*

Drupes large, ovate or oblong, about an in. long; staminal tube white, about 1½-2 lin. long, glabrous outside; leaflets crenate or ultimately entire . . . . . *M. dubia.*

Drupes large, almost globose, about an in. or more thick; staminal tube 2-4 lin. long, white, woolly at the summit; leaflets entire *M. Birmanica.*

1. **M. excelsa,** Jack in Mal. Misc. i. 12; H.f. Ind. Fl. i. 544.—An evergreen tree, 50 ft. high, glabrous; leaves simply pinnate, crowded at the end of the branchlets, 2-2½ ft. long, the petiole terete thickened and somewhat scaly at the base; leaflets in 7-9 pairs with an odd one, alternate or nearly opposite, ovate-oblong, very oblique and almost auricled at the base, on petiolules 1½-2 lin. long, rather bluntish acuminate, 3-6 in. long, quite entire, glabrous; flowers 2-2½ lin. long, white, on short bracteoled pedicels, forming a large glabrous panicle about as long as the leaves; calyx short with rounded sepals; petals 5, puberous outside; staminal tube 10-furrowed, bluntish, 10-20-toothed, glabrous outside; anthers 10, somewhat exserted; ovary glabrous, the style rather strongly filiform; ovary 3-celled.

Hab.—Tenasserim, Mergui, probably cultivated.—Fl. Decb.

2. **M. Azadirachta,** L.; H.f. Ind. Fl.i. 544; Bedd. Sylv. Madr. t. 13 (14 by mistake).—(*M. Indica,* Brand. For. Fl. 67).—*Thinbow-ta-ma-kha.*—A tree (40—80 + 18—40 + 4—6), shedding leaves in H.S., the very young shoots slightly puberulous; leaves usually unpaired-pinnate, glabrous, the rachis glabrous or slightly puberulous above; leaflets in 7-8 pairs with or without an odd one, opposite or nearly so, falcate-lanceolate, very unequal, very shortly petioluled, about 1½-2 in. long, long acuminate, serrate; flowers small, white, on short puberulous pedicels, forming glabrous raceme-like solitary panicles in the axils of the leaves and shorter than them; calyx minute, glabrous, the lobes rounded; petals glabrous, 1½ lin. long; staminal tube as long as the petals, glabrous outside, puberulous within, somewhat widened at summit; drupes oblong, the size of a large pea or about 5-6 lin. long, oblong, yellowish-green, the stone nearly always 1-celled and 1-seeded.

Hab.—Not unfrequent in the drier forests of Prome, especially on the higher ridges of the Yomah; also Ava.—Fl. March.—l.—SS.=CaS.

Remarks.—Wood very like mahogany, the sapwood small, rather coarse and whitish, the heart-wood red-brown, close-grained, when old often beautifully mottled, hard and heavy; takes a fine polish, and is durable. Good for cart-wheels and ordinary building purposes, furniture; also fitted for ship-building. Bark bitter and used as a febrifuge. Exudes also a gum.

3. **M. Azedarach,** L.; H.f. Ind. Fl. i. 544; Bedd. Sylv. Madr. t. 14 (13 by mistake); Brand. For. Fl. 68.—*Tha-ma-kha.*—A tree (40—50 + 12—20 + 3—4), leafless during H.S., the shoots usually mealy-puberulous; leaves bipinnate, glabrous when adult, the petiole terete; pinnæ usually in 3-4 pairs, the uppermost ones often 3-foliolate; leaflets in 3 to 2 pairs with an odd one, opposite or nearly so, usually obliquely ovate or ovate-oblong, about 1½-2 in. long, very shortly petioluled, while young coarsely serrate, afterwards often only serrulate or entire towards the long acumination; flowers rather

small, white or pale lilac, on slender pedicels, forming solitary more or less puberulous axillary panicles shorter than the leaves; calyx puberulous, the lobes oblong-lanceolate; petals 3-3½ lin. long, minutely puberulous; staminal tube bluish-lilac, slender, about 3 lin. long, glabrous outside, sparingly pilose within, many-cleft at the summit; ovary 5-celled; drupes oblong, the size of a large pea or larger, yellow, the stone obtusely 5-cornered, bony, 5-celled.

Hab.—Prome and Ava, in and around villages, apparently only cultivated; wild in the adjoining Siamese provinces.—Fl. Febr.-March; Fr. March-April.

Remarks.—Wood pale brown or reddish, striate, rather loose-grained, rather light; takes a fine polish. Good for furniture, but warps and splits.

4. **M. Birmanica,** Kz.—*Taw-tha-ma-kha.*—A tree (40—60 + 12—20 + 3—5), shedding leaves in H.S., all the younger parts greyish or yellowish scurfy-tomentose; bark brownish-grey, about 2 lin. thick, rather even, longitudinally fissured and corky-lenticellate; cut greenish-white; leaves bipinnate, petiole long and terete; pinnæ usually in 5 to 3 pairs; leaflets of the main pinnæ in 5, of those below and above gradually in fewer pairs, ovate or ovate-lanceolate, rounded or acute at base, sometimes somewhat unequal, 1½-2 in. long, shortly acuminate, entire, on short but slender usually puberulous petiolules; flowers greenish-white, rather small, on very short scurfy-tomentose pedicels or almost sessile, forming yellowish or greyish scurfy-tomentose corymbose axillary panicles shorter than the leaves; calyx deeply 5-cleft, the lobes oblong-lanceolate, acute, mealy-puberulous; petals about 3 lin. long, velvety outside, densely puberulous inside; staminal tube only 2 lin. long, white, pilose inside, and at the summit very woolly between the anthers; drupes globose or nearly so, about an in. in diameter or larger, yellowish, smooth, very fleshy, containing an obtusely 5-8-angular and 5-8-celled globular putamen.

Hab.—Frequent in the tropical forests of Martaban.—Fl. March-Apr.; Fr. Apr.-May.—s.– SS.=Metam.

Remarks.—Sapwood white, of a silvery lustre, rather heavy, coarsely and somewhat unequally fibrous; heart-wood brown, soft.

CIPADESSA, Bl.

Calyx cup-shaped, 5-toothed. Petals 5, induplicate-valvate. Staminal tube 10-parted, entire at base and united with the disk, the lobes linear or 2-cleft at apex, bearing the 10 anthers between. Disk cupular. Ovary 5-celled, with 2 collateral ovules in each cell; style rather short, club-shaped at summit. Drupe 5-lobed, containing 5 coriaceous 1- or 2-seeded stones. Seeds pendulous. Albumen fleshy.—Shrubs or small trees, with alternate unpaired-pinnate leaves. Flowers minute, panicled.

1. **C. baccifera,** Miq. (*Cip. fruticosa,* Bl.; H.f. Ind. Fl. i. 545 (*Mallea Rothii,* Juss.; Bedd. Sylv. Madr. 54, t. 8, f. 5).—A small evergreen tree or shrub, the younger parts puberulous; leaves unpaired-pinnate, the rachis terete; leaflets in 3 to 4 pairs with an odd one, oblong or ovate-oblong, unequal, and more or less oblique, bluntish or sharply acuminate, $2\frac{3}{4}$-3 in. long, on short but slender usually puberulous petiolules, entire or coarsely serrate-toothed, glabrous; flowers minute, white, on slender puberulous pedicels, forming long peduncled puberulous or almost glabrous lax panicles in the axils of the leaves and shorter than them; bracts and bractlets all linear; petals lanceolate, acute, about a line long; staminal tube shorter than the petals; the filaments ciliate; drupes globular, the size of a pepper-kernel or small pea, red, glabrous, containing 5 firmly coriaceous one-seeded nuts.

Hab.—Ava.

DYSOXYLON, Bl.

Flowers hermaphrodite. Calyx 4 or 5-toothed or -cleft, open already in bud. Petals 4 or 5, free, valvate. Staminal tube cylindrical, rarely cornered, shortly 8-10-toothed at summit; anthers as many as teeth, included in the tube. Disk tubular, usually longer than the ovary and sheathing. Ovary 3-5-celled, with 1 rarely 2 ovules in each cell; style slender. Capsule usually irregularly pear-shaped, loculicidally 2-5-valved, the valves bearing the septum in the centre. Arillus none.—Trees, with abruptly or unpaired-pinnate leaves. Flowers in axillary lax panicles.

Calyx, petals, and reproductive organs perfectly glabrous . . *D. binectariferum.*
Calyx, petals, and staminal tube minutely pubescent . . . *D. procerum.*

1. **D. procerum,** Hiern. in H.f. Ind. Fl. i. 547.—An evergreen tree (60—70 + 30—40 + 4—5), the young shoots slightly pubescent; leaves abruptly or unpaired-pinnate, the rachis glabrous; leaflets in 3 to 6 pairs with or without an odd one, shortly petioluled, opposite and alternate, from ovate-oblong to oblong-lanceolate, unequal at the acute base, bluntish acuminate or acute, entire, chartaceous, 5-10 in. long, glabrous; flowers white, middling-sized, on jointed puberulous pedicels, forming axillary solitary glabrous spreading panicles as long or shorter than the leaves; calyx puberulous, cup-shaped, truncately 4-toothed; petals 4, spatulate, blunt; disk tubular, longer than the ovary, densely tawny pubescent inside; staminal tube as long as the style, minutely pubescent, truncate and obscurely 8-toothed at summit, the teeth notched; ovary and style half-way appressed rusty-pubescent; capsules pyriform, the size of the fist, with a thick coriaceous pericarp.

Hab.—Rare in the tropical forests of the southern slopes of the Pegu Yomah; also Tenasserim.—Fl. Dec.—s.—SS.=Lat. p.

2. **D. binectariferum,** Bedd.; H.f. Ind. Fl. i. 546.—An evergreen tree, 50 to 60 ft. high, the leaf-buds minutely tawny puberulous; leaves abruptly pinnate; the petioles above flat, the rachis, however, acutely produced; leaflets alternate, in 3-4 pairs, obliquely ovate-lanceolate to oblong-lanceolate, unequal at the acute base, on a 3-4 lin. long petiolule, acuminate, 5-6 in. long, thin coriaceous, entire, glabrous; flowers middling-sized, white, shortly pedicelled, forming rather short narrow minutely puberulous panicles in the axils of the leaves; calyx hemispherical, very coriaceous, obsoletely 4-toothed; petals 4, coriaceous, oblong, acute, reflexed when fully open; staminal tube about 2 lin. long, shortly 8-toothed, the teeth notched; disk tubular, a line long; ovary and style-base densely tawny pubescent; capsules globose, pear-shaped, the size of an apple, thick coriaceous, when fully ripe deep yellow, smooth, 4-celled and 4-valved, each cell containing a solitary obovate-oblong seed of the size and shape of a chestnut.

Hab.—Chittagong.—Fl. June; Fr. Febr.

SCHIZOCHITON, Bl.

Flowers polygamously dioecious. Calyx bell-shaped or urceolate, 4- or rarely 5-toothed, open already in bud. Petals united with the staminal tube into a longer or shorter tube, twisted or valvate. Staminal tube long, cylindrical, 6-8-lobed at summit, the lobes entire; anthers alternating with the lobes, included in the tube. Disk short, sheathing the ovary. Ovary 3-4-celled, with a solitary ovule in each cell; style filiform. Capsule coriaceous, 3-4-celled, opening loculicidally, the valves bearing the septum in the middle. Arillus complete or incomplete.—Trees, with abruptly pinnate leaves. Flowers usually very long and slender, in supra-axillary large panicles.

* *Flowers almost sessile or very shortly and stoutly pedicelled.*

Leaves quite glabrous . . . . . *Sch. dysoxylifolius.*
Leaves softly pubescent beneath . . . . . *Sch. grandiflorus.*

* * *Flowers on slender pedicels.* Softer parts pubescent *Sch. paniculatus.*

1. **Sch. dysoxylifolius,** Kz. (*Chisogeton dysoxylifolius,* Hiern. in H.f. Ind. Fl. i. 551).—An evergreen tree, all parts glabrous; leaves large, resembling those of *Dysoxylon alliaceum,* abruptly pinnate, glabrous; leaflets alternate, on short thick puberulous petiolules, oblong or oblong-lanceolate, somewhat unequal, acuminate, entire, chartaceous, 10-12 in. long, glabrous; flowers about 6 lin. long, tubular, almost sessile, subtended by a small lanceolate very pubescent bractlet and forming short pubescent racemes arranged in more or less pubescent panicles shorter than the leaves; calyx bell-shaped, obsoletely 4-toothed, minutely pubescent; petals about 6

lin. long, obovate-linear, puberulous; staminal tube as long as the style, from the middle adnate to the petals, appressed yellowish pubescent outside, 6-cleft at the summit, the lobes oblong, blunt, glabrous; anthers 6, alternating with the lobes; ovary and style up to the middle appressed pubescent.

Hab.—Tenasserim.—Fl. March.

2. **Sch. grandiflorus,** Kz. (*Chisogeton grandiflorus,* Hiern. in H.f. Ind. Fl. i. 551).—An evergreen tree (40—50 + 18—30 + 3—4), all softer parts softly and shortly pubescent; bark about ¼ in. thick, rough from corky warts; cut rather dry, reddish; leaves abruptly pinnate with an abortive process between the last pair of leaflets, or unpaired-pinnate, the rachis densely tawny pubescent; leaflets in 4 to 6 pairs, sometimes with an odd one, opposite or nearly so, on a short thick tomentose petiolule, oblong or oblong-lanceolate, shortly acuminate, entire or nearly so, 6-8 in. long, above (with the exception of the midrib and nerves) glabrescent, beneath softly pubescent; flowers about 6 lin. long, almost sessile, and subtended by a broadly oblong densely tawny pubescent bractlet and forming short dense racemes arranged in a long-peduncled densely tawny tomentose slender axillary panicle shorter than the leaves; calyx bell-shaped, densely pubescent, obsoletely 4-toothed; petals about 6 lin. long, densely pubescent, the tips imbricate; staminal tube towards the base adnate to the petals, slightly pubescent, 6-7-crenate-lobed at summit, the lobes truncate-oblong, alternating with as many anthers; ovary and style tawny pubescent; capsules 3-lobed and pear-shaped, about 1½ in. long, with a thick coriaceous yellow pericarp, 3-valved; seeds large, enveloped in a complete arillus.

Hab.—Frequent in the tropical forests of Martaban and Tenasserim.—Fr. March-Apr.—s.—SS.=Metam.

Remarks.—Wood pale-brown, heavy, irregularly coarse-fibrous, but close-grained, rather hard.

3. **Sch. paniculatus,** Hiern.; H.f. Ind. Fl. i. 552.—An evergreen tree, all softer parts pubescent; leaves unpaired-pinnate, 1½-2½ ft. long, the rachis terete, pubescent; leaflets in 6-12 pairs with an odd one, somewhat obliquely oblong or ovate-oblong, on short tawny tomentose petiolules, opposite or nearly so, chartaceous, 4 to 10 in. long, pubescent beneath, more or less glabrescent except on the nerves; flowers small, 4-merous, on slender about 1-2 lin. long pedicels, cymulose, and forming ample elongate tawny pubescent panicles in the axils of the leaves and usually longer than them; calyx obsoletely 4-toothed, small; petals about ½ in. long or somewhat longer, puberulous; staminal tube more or less pubescent, bluntish, 6-8-lobed, the lobes deeply 2-cleft; style pubescent

towards the base; capsules globose-pear-shaped, the size of a wood-apple, velvety, orange-red, 4-valved.

Hab.—Ava and Pegu (?)

SANDORICUM, Cav.

Calyx cup- or almost bell-shaped, shortly 5-lobed, the tube adnate to the base of the ovary. Petals 5, free, imbricate. Staminal tube cylindrical, 10-toothed at the summit; anthers 10, included in the tube. Disk tubular, 5-toothed, sheathing the ovary and style-base. Ovary immersed in the calyx-base, 5-celled, with 2 pendulous ovules in each cell; style columnar, club-shaped and annular upwards. Berry fleshy, indehiscent, 3- to 5-celled, the septa absorbed during maturation. Seeds solitary, arillate.—Trees, with 3-foliolate leaves. Flowers solitary or clustered, in axillary panicles.

1. **S. Indicum,** Cav.; H.f. Ind. Fl. i. 553; Bedd. Sylv. Madr. 55.—*Thit-to.*—An evergreen tree (50—60 + 20—30 + 6—7), all softer parts pubescent; bark grey, even, roughish and minutely wrinkled; leaves pinnately 3-foliolate, on a softly pubescent long petiole; leaflets broadly ovate to ovate-oblong, 5-8 in. long, acuminate, entire, membranous, especially along the nerves puberulous, more or less glabrescent, the lateral ones on a very short, the terminal one on an 1-2 in. long pubescent petiolule; flowers rather small, yellow, very shortly pedicelled, subtended by a linear membranous bractlet, in short dense clusters, forming a narrow tomentose axillary panicle shorter than the leaves; calyx tomentose; petals minutely pubescent; staminal tube about 4 times longer than the nearly 10-toothed tubular disk, the latter sheathing the ovary and style-base; berries almost globose, the size of a lime, slightly tomentose, yellow, filled with a fleshy acid edible pulp, by maceration 1-celled; arillus replete with tough woolly fibres; seeds brown, glossy, with a spongy testa.

Hab.—In the tropical forests of the southern slopes of the Pegu Yomah and Tenasserim; much cultivated in Burmese villages.—Fl. Jan.; Fr. Apr.-May.—s.—SS.=Metam. Lat. p.

Remarks.—Wood dark, brownish-grey, hard and heavy. Employed for carts, boat-building, etc.

AGLAIA, Lour.

Flowers polygamously dioecious. Calyx 5-toothed or -cleft, imbricate. Petals 5, free or united at base, imbricate. Staminal tube urceolate or almost globose, entire or 5-toothed at the summit; anthers 5, included in the tube or half-exserted. Disk inconspicuous. Ovary 1-3-celled, with 1 or 2 ovules in each cell; style

short and thick. Berry coriaceous or almost succulent, indehiscent. Seeds with a sappy arillus.—Trees, with pinnate or digitate or rarely 3-1-foliolate leaves. Flowers minute, almost globular, in axillary panicles.

* *Calyx, pedicels, panicle, and often also all other softer parts, more or less scaly.*

× Leaflets usually in 2 pairs with an odd one, nearly glabrous.

Scales of the younger parts and of the small sessile panicle pale-coloured . . . . . *A. Andamanica.*

Scales of the younger parts and of the ample peduncled panicle rusty brown . . . . . *A. paniculata.*

× × Leaflets pinnately 3-foliolate . . . . . *A. Chittagonga.*

× × × Leaflets usually in 8 to 5 pairs with an odd one, beneath densely silvery or coppery scaly.

Panicle ample, densely silvery or coppery scaly; flowers sessile . *A. argentea.*

* *Calyx, pedicels, and usually the whole inflorescence rusty-puberulous or tomentose from stellate hairs.*

Leaves very large, leaflets in 8 or more pairs, the lateral nerves all very sharply prominent; panicles, etc., rusty-puberulous; flowers pedicelled . . . . . *A. crassinervia.*

Leaflets in 6-7 pairs; the petioles, inflorescence, and berries rusty-tomentose . . . . . *A. Griffithii.*

* * Calyx and pedicels glabrous.

Leaflets in 1 or 2 pairs, sometimes solitary; panicles slightly stellately pubescent, soon glabrous . . . . . *A. oligophylla.*

1. **A. Andamanica,** Hiern. in H.f. Ind. Fl. i. 555.—An evergreen tree (30—40+8—15+2—4), the young shoots sparingly covered with coarse pale coloured scales; leaves unpaired-pinnate, while young sprinkled with pale-coloured or silvery scales, soon quite or almost quite glabrous, the rachis indistinctly scaly; leaflets usually in 2 pairs with an odd one, on slender scaly petiolules about 3-4 lin. long, especially at the acute base somewhat oblique, ovate to ovate-oblong, shortly and bluntish acuminate, 3-5 in. long, coriaceous, the lateral nerves beneath thin, but sharply prominent, without veins or net-veination; fruiting panicles short and robust, sessile, covered with a dense indistinctly scaly and pale-coloured tomentum; ripe berries 1½ in. long, ellipsoid, minutely scaly, crimson, very shortly and thick peduncled.

Hab.—Not unfrequent in the tropical forests of the Andamans.—Fr. Febr.

2. **A. Chittagonga,** Miq.—An evergreen tree (30—40+15-20+3—4), the softer and younger parts silvery scaly and more or less glabrescent; leaves pinnately 3-foliolate, the petiole scaly and more or less glabrescent; leaflets opposite or nearly so, on densely scaly 2-4 lin. long, strong petiolules, oblong to elliptically oblong, apiculate or shortly acuminate, coriaceous, 4-7 in. long, opaque, glabrous above, beneath sprinkled with silvery scales; flowers unknown; berries (unripe) obovoid, the size of a cherry, densely silvery or gilvous-scaly, on short stout peduncles, forming a poor robust pale-

scaly panicle in the axils of the leaves of about the length of the petiole or somewhat longer.

Hab.—In the tropical forests of Chittagong and Arracan.—s.—SS.=SiS.

2. **A. paniculata,** Kz.—A middling-sized evergreen tree, the young shoots clothed with a dark-brown or coppery scaly down, soon glabrescent; leaves unpaired-pinnate, glabrous, the rachis terete, minutely rusty, scaly, and glabrescent; leaflets usually in 2 pairs with an odd one, almost opposite, ovate to ovate-oblong, on a rusty scaly 2-2½ lin. long petiolule, bluntish and abruptly acuminate, 4-9 in. long, coriaceous, glabrous and opaque, the end leaflets ternary or pinnately remote; flowers minute, on short rusty-scaly slender pedicels, forming ample rusty-scaly tomentose panicles in the axils of the leaves and as long or somewhat shorter than them; calyx rusty-scaly, the lobes broad and blunt; petals ½ a line long, free; anthers 5; berries unknown.

Hab.—Not unfrequent in the tropical forests of the Pegu Yomah; Tenasserim.—Fl. March.

3. **A. argentea,** Bl.—A small evergreen tree, all parts silvery or coppery lepidote; leaves large, unpaired-pinnate, 2-2½ ft. long, the petiole and rachis densely lepidote; leaflets opposite or nearly so, in 5 to 8 pairs with an odd one, from lanceolate and ovate to elliptically lanceolate, on a short thick petiolule, unequal at base, acuminate, from ½ to 1½ ft. long, thin coriaceous, glabrous above, beneath densely silvery lepidote, the lateral nerves strong and numerous; flowers sessile, minute, forming ample axillary densely lepidote-tomentose panicles; calyx 5-lobed, densely pubescent; petals 5, elliptically oblong, blunt, glabrous; staminal tube 5-toothed, the teeth blunt; ovary minutely hairy; berries obovoid, while young lepidote, glabrescent, 1-2-seeded.

Hab.—Rare in the tropical forests of the eastern slopes of the Pegu Yomah, west of Tounghoo.—s.—SS.=SiS.

4. **A. crassinervia,** Kz.; H.f. Ind. Fl. i. 556.—An evergreen tree, the shoots probably scaly; leaves large, unpaired-pinnate; the rachis terete, minutely rusty puberulous; leaflets in 4 or more pairs with an odd one, linear-oblong or oblong-lanceolate, almost opposite or alternate, on a 2-3 lin. long thick petiolule, 6-10 in. long, acuminate, entire, glabrous above, beneath densely and minutely scaly tomentose, more or less glabrescent, the lateral nerves all parallel and numerous, very sharply prominent; flowers minute, on short rusty puberulous pedicels, forming large rusty puberulous panicles in the axils of the leaves.

Hab.—Tenasserim.

5. **A. Griffithii,** Kz.—A small evergreen tree, all the younger parts densely rusty pubescent; leaves unpaired-pinnate; the rachis

densely rusty-tomentose; leaflets in 7-4 pairs with an odd one, on a short but slender rusty pubescent petiolule, linear-lanceolate or lanceolate, acuminate, waved, glabrous above, beneath sprinkled with a rusty minute tomentum and densely rusty-tomentose along the midrib and the lateral nerves, the end-leaflets usually ternary; flowers yellowish, minute, on short rusty-tomentose pedicels, forming densely rusty-tomentose lax shortly peduncled panicles in the axils of the leaves; calyx tomentose; the lobes ovate, acute; petals about a line long; anthers 5; berries globose, the size of a cherry, minutely stellately velvety, 1-seeded.

HAB.—Tenasserim.

6. **A. oligophylla,** Miq.—An evergreen tree, the young shoots scurvy-puberulous or almost tomentose; leaves unpaired-pinnate, rarely 2-1-foliolate, the rachis short, puberulous, soon glabrescent; leaflets in 1 or 2 pairs with an odd one, or reduced to fewer, obovate-oblong to oblong-lanceolate, on a rather short thickened glabrous petiolule, acute at base, 3-4½ in. long, bluntish acuminate, glabrous, laxly net-veined on both sides; flowers minute, yellow, on short but slender glabrous pedicels, forming slightly hairy and a little scaly but soon glabrescent panicles in the axils of the leaves and shorter than them; calyx-segments rotundate, blunt, glabrous, obsoletely ciliolate.

HAB.—Tenasserim.

AMOORA, Roxb.

Flowers polygamously dioecious. Calyx cup-shaped, 3-5-toothed, usually bracted. Petals 3, imbricate. Staminal tube almost globular, obscurely 6-10-crenate or entire; anthers 6-10, included in the tube. Disk none. Ovary 3-5-celled, with 1 or 2 superposed ovules in each cell; style elongate or none. Capsule coriaceous, 3-5-celled, loculicidally opening in 3 to 5 valves, the valves bearing the septum on the middle. Seeds arillate.—Trees, with unpaired-pinnate leaves. Flowers small, the males in axillary panicles, the females often in axillary spikes or racemes.

* *Petals* 3. *Anthers* 6-8.
× Flowers sessile, spiked, the male spikes panicled.
Leaflets shortly acuminate; male flowers about 4 lin. in diameter . *A. Rohituka.*
× × Flowers pedicelled, cymose-panicled.
○ Panicles ample, as long to half as long as the leaves.
Leaflets shortly acuminate, thin coriaceous, the nerves prominent . *A. spectabilis.*
Leaflets blunt, coriaceous, the nerves above obsolete . . . *A. cucullata.*
○ ○ Panicles slender, as long or shorter than the petiole; panicle very lax, slender, densely scaly *A. lactescens.*
** *Petals* 5; *stamens* 10; panicles short, densely scaly . *A. dysoxyloides.*

1. **A. Rohituka,** WA.; H.f. and Th. Ind. Fl. i. 559; Bedd. Fl. Sylv. t. 132; Brand. For. Fl. 69.—*Thit-nee.*—An evergreen tree

(50—60+20—30+4—5), the shoots puberulous; bark about 3 lin. thick, brownish-grey, corky-cracked, oblong-squared; cut red; leaves unpaired-pinnate, glabrous, the terete rachis often puberulous and glabrescent; leaves in 5 to 8 pairs with an odd one, opposite, rather shortly petioluled, oblong or linear-oblong, somewhat unequal at base, 3-5 in. to about a foot long, shortly and bluntish acuminate, entire, thin coriaceous, glabrous or sometimes puberulous along the midrib; flowers greenish or pale-yellow, sessile or nearly so, about 4 lin. in diameter, the males forming spikes arranged in glabrous axillary panicles, the hermaphrodite ones in simple many-flowered axillary often puberulous spikes; petals 3, oval; staminal tube globular, fleshy, entire, the 6 anthers included and almost sessile; ovary 3-celled; capsules globose, about $1\frac{1}{4}$-$1\frac{1}{2}$ in. thick, while young puberulous, rather fleshy-coriaceous, opening into 3 valves; seeds rather large, oblong, completely enclosed in the fleshy scarlet arillus.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim, up to 3,000 ft. elevation.—Fr. Apr.-May.—s.—SS. = Metam. SiS. Lat. p.

Remarks.—Wood white, turning pale-brown, the heartwood darker coloured, rather heavy, streaked, rather coarse-fibrous, but close-grained, takes a fine polish. □′=80 pd. Adapted for house-building. Seeds yield an oil.

2. **A. cucullata,** Roxb.; H.f. Ind. Fl. i. 560.; Bedd. Sylv. Madr. 55.—*Thit-nee.*—An evergreen middling-sized tree, all parts glabrous; leaves unpaired-pinnate, glabrous; leaflets in 3 to 4 pairs with an odd one, opposite, shortly petioluled, obliquely ovate-lanceolate, blunt, entire, thin coriaceous; flowers small, yellow, the males about 2 lin. in diameter, on rather short thick pedicels, forming drooping branched sparingly scaly axillary panicles of about the length of the leaves, the hermaphrodite ones by 3-6 in a short thick axillary spike; petals 3, oval, concave; staminal tube turbinate, fleshy, slightly 3-toothed at the summit, the 6-8 oblong anthers sessile, included; ovary 3-celled; capsules nearly globose, obtusely 3-lobed, as large as a middling-sized apple, toughly fleshy-coriaceous, 3-valved; seeds large, roundish, 3-angular, covered for $\frac{2}{3}$ by a fleshy bright orange-coloured arillus.

Hab.—Forests of Lower Pegu and Tenasserim.—Fl.-Sept.—s.

Remarks.—Wood brown, rather hard and strong, but not heavy. Adapted for house-building.

3. **A. spectabilis,** Miq.; H.f. Ind. Fl. i. 561.—An evergreen tree, the leaf-buds and young shoots indistinctly tawny puberulous; leaves unpaired-pinnate, $1\frac{1}{2}$-2 ft. long, on a minutely tawny puberulous glabrescent petiole $\frac{1}{2}$ $1\frac{1}{4}$ ft. long; leaflets in 5-6 pairs with an odd one, almost opposite, on 2-3 lin. long petiolules, oblong to ovate-oblong, shortly and rather abruptly acuminate, $3\frac{1}{2}$-5 in. long,

rather thin coriaceous, glabrous, the lateral nerves numerous, and, like the veins and net-veination, conspicuous on both sides; male flowers shortly pedicelled, racemulose or almost cymulose, forming an ample short-peduncled minutely tawny puberulous glabrous panicle in the axils of the leaves and usually shorter than them; calyx minute, 3-lobed, tawny puberulous; petals 3, a line long, almost glabrous; staminal tube urceolate, shortly and bluntish 8-toothed; anthers usually 8; fruits obovoid, the size of a wood-apple, shortly and stoutly peduncled, minutely ochraceous-tomentose.

Hab.—Pegu, Rangoon.

4. **A. lactescens,** Kz.—An evergreen tree (30—40 + 10—15 + 3—4), the young shoots covered with pale-coloured scales; bark nearly 2 lin. thick, brown, even, covered with minute lentils; cut pale coloured, milky; leaves unpaired-pinnate, the rachis terete, minutely scaly, but soon glabrescent; leaflets in 3-2 pairs with an odd one, alternate, oblong to lanceolate-oblong, on 2-3 lin. long petiolules, oblique at the acute base, acuminate, chartaceous, green, glabrous, 3-5 in. long, the nerves and veination, especially above, conspicuous; flowers pretty large, on curved silvery-lepidote slender pedicels 1-1½ lin. long, forming a lax sessile slender slightly branched densely scaly panicle in the axils of the leaves and shorter than the petiole; calyx densely scaly; petals 3, about a line long or longer, glabrous, concave-rotundate; anthers 6; fruit obovoid-globular, while young scurfy scaly, the size of a cherry.

Hab.—Rather rare in the tropical forests of Martaban.—s.—88.=Metam.

5. **A. dysoxyloides,** Kz.—An evergreen middling-sized tree, the younger parts greyish scaly; leaves unpaired-pinnate, about a foot long, the rachis, petiole, and midrib beneath densely greyish scaly; leaflets in 3 pairs with an odd one, alternate, oblong, obliquely acute at the base, on scaly 2-3 lin. long petiolules, 4-5 in. long, rather abruptly and bluntish acuminate, thin coriaceous, nigrescent, opaque, beneath sprinkled with minute silvery scales; flowers small, on short, thick, scaly pedicels, forming a robust but small densely greyish or gilvous scaly sessile panicle in the axils of the leaves much shorter than the petiole; calyx short, thickly scaly, 5-toothed; petals 5, hardly a line long, obovate-oblong, glabrous; staminal tube glabrous; anthers 10; ovary ovoid, pale hirsute; stigma sessile, large, glabrous.

Hab.—Martaban.

WALSURA, Roxb.

Calyx 4-5-cleft, imbricate. Petals 4 or 5, free, imbricate or almost valvate. Staminal tube deeply 8-10-cleft, the lobes linear-subulate or 2-cleft, or the filaments all free; anthers exserted. Disk annular, fleshy. Ovary 2 3-celled, immersed in the disk, with

2 ovules in each cell; style short. Berry fleshy or coriaceous, indehiscent or bivalvar-dehiscing, one-celled and 1-seeded. Seeds enclosed in a fleshy arillus.—Trees, with unpaired-pinnate or 3-1-foliolate leaves. Flowers small, in axillary and terminal panicles.

* *Berries indehiscent, usually velvety or tomentose.*
- ○ Inflorescence densely pubescent; berries densely tomentose . . . . . *W. villosa.*
- ○ ○ Inflorescence minutely puberulous; leaves and petioles glabrous.

Leaves beneath usually white-areolate within the net-veination; filaments broadly lanceolate, sprinkled with minute hairs . *W. robusta.*
Leaflets uniformly glaucous beneath; filaments linear, densely pubescent; flowers larger . . . . . *W. hypoleuca.*
As former, but leaflets very thin chartaceous and net-veination very faint . . . . . *W. oxycarpa.*

** *Berries follicular-dehiscing, usually quite glabrous.*
Leaves and inflorescence quite glabrous . . . . . *W. trijugar.*
Leaves beneath and inflorescence softly pubescent . . . *W. pubescens.*

1. **W. villosa,** Wa.; H.f. Ind. Fl. i. 564.—*Gyo-bo.*—A tree (30—50 + 15—25 + 3—4), often remaining stunted, shedding leaves in H.S., the younger parts all densely pubescent; bark about ½ in. thick, blackish grey, longitudinally fissured; cut red; leaves unpaired pinnate, the young rachis more or less pubescent; leaflets in 2 pairs with an odd one, obovate-oblong, oblong or ovate-oblong, usually blunt or almost notched, rarely bluntish or shortly acuminate, rounded or acute at base, on a 2 lin. to ½ an in. long petiolule, entire, coriaceous, 3-5 in. long, above glabrous or slightly pubescent along the midrib, beneath, especially while young, slightly pubescent along the nerves or rarely the whole undersurface slightly puberulous; flowers small, greenish-yellow, on short tomentose pedicels, forming corymbose almost sessile or shortly peduncled densely tawny pubescent panicles in the axils of the upper-leaves; calyx densely and shortly pubescent, the lobes broadly oblong, acute; petals oblong, pubescent; filaments flat, entire, very broad towards the base, and here slightly cohering, sparingly pilose; berries oblong, indehiscent, the size of a small plum, leathery, densely and shortly tawny tomentose.

Hab.—Frequent in the Eng and low forests from Pegu and Martaban down to Tenasserim; also Ava.—Fl. March-Apr.; Fr. May-June.—l.—SS. = *Lat.* Dil.

Remarks.—Wood brown, heavy, coarse, fibrous, but close-grained, rather hard.

2. **W. robusta,** Roxb.; H.f. Ind. Fl. i. 565.—*Gyo-pho.*—An evergreen tree (40—60 + 10—25 + 3—5), the younger shoots minutely greyish puberulous; bark about 2 lin. thick, grey, covered with small corky lentils, soon peeling off in thin irregularly 4-sided pieces; cut dry, red; leaves quite glabrous, unpaired-pinnate, the rachis sprinkled with pale lentils; leaflets in 2 pairs with an odd

one, ovate-oblong and oblong to oblong-lanceolate, on a 4-5 lin. (the terminal one on a 1-1½ in.) long petiolule, 3-5 in. long, long and bluntish acuminate or cuspidate, rounded or acuminate at base, glabrous, chartaceous, beneath marked with white dots on the areoles between the net-veination; flowers small, white, on very short puberulous pedicels, forming rather long-peduncled minutely greyish puberulous glabrescent corymbose panicles in the axils of the leaves and shorter than them; calyx shortly pubescent, the lobes oblong, blunt; petals oblong, acute, puberulous; filaments all free, broad and flat, sprinkled with short hairs; berries elliptical or globular, the size of a cherry, greyish velvety, indehiscent, containing a single seed completely enclosed in the arillus.

Hab.—In the tropical forests of the eastern slopes of the Pegu Yomah, rather rare, but frequent in those of Martaban down to Tenasserim and the Andamans.—Fl. May; Fr. July.—s.—SS.=Metam. Lat. p. SiS. etc.

3. **W. hypoleuca,** Kz. ; H.f. Ind. Fl. i. 564.—An evergreen tree (40—50 + 2 + 4—5), the younger shoots minutely puberulous; leaves unpaired-pinnate, quite glabrous, the rachis smooth or with a few lentils; leaflets in 2 pairs with an odd one, elliptically or lanceolate-oblong, on an in. (the terminal one on a 2-2½ in.) long or shorter glabrous petiolule, 6-8 in. long, obtuse or acute at base, chartaceous, bluntish and shortly or long-acuminate, glabrous, very glaucous beneath, but without whitish areoles; flowers rather small, white, on 1-2 lin. long puberulous pedicels, forming sessile or almost sessile puberulous corymbose panicles in the axils of the leaves and shorter than them; calyx puberulous, the lobes oblong, bluntish; petals 5, occasionally increased to 8, linear-lanceolate, acute, puberulous, nearly 2 lin. long; stamens 10, sometimes as many as 15, all free the filaments linear, narrower than the anthers, and equally broad, entire, villous; disk thick, red; ovary immersed, densely tawny tomentose; unripe berries oblong, acuminate, greyish-velvety.

Hab.—Frequent in the tropical forests of South Andaman.—Fl. May-June. —s.—SS.=SiS., chloritic rocks.

4. **W. oxycarpa,** Kz.—An evergreen tree (40—50 + 10—18 + 4—6), the leaf-buds tawny puberulous; leaves unpaired-pinnate; the petiole and rachis sparingly lenticelled, glabrous, slender; leaflets in 2 pairs with an odd one, on ½-¼ in. long slender petiolules, lanceolate to oblong-lanceolate, 3-4½ in. long, thin chartaceous, rather long-acuminate, beneath uniformly glaucescent, the net-veination very thin and inconspicuous; fruiting panicles very slender and long peduncled, poorly branched, glabrous, shorter than the leaves; unripe fruits ovate-oblong, ½ in. long, greyish-velvety, acuminate.

Hab.—Not unfrequent in the tropical forests of the Andamans.—s.—SS.= SiS. Metam.

5. **W. trijuga,** Kz. (*Heynea trijuga,* Roxb.; H.f. Ind. Fl. i. 565; Brand. For. Fl. 70; *Heynea affinis,* Juss.; Bedd. Sylv. Mad. t. 134).—Apparently an evergreen tree, the young shoots pubescent; leaves unpaired-pinnate, the rachis terete and glabrous; leaflets usually in 5 pairs, but often varying from 3 to 6 pairs, with an odd one, ovate or lanceolate-oblong, on a short glabrous petiolule, acute or obtuse at base, acuminate, membranous, entire, quite glabrous, glaucous beneath; flowers small, white, on short but slender, glabrous or puberulous pedicels, forming brachiate, glabrous, corymbose, long-peduncled panicles in the axils of the leaves and sometimes longer than them; calyx glabrous; petals puberulous; filaments slightly cohering in a tube, 2-cleft at the apex, slightly puberulous; capsules elliptical or almost globose, the size of a small cherry, glabrous, opening in two leathery valves, containing a single seed enveloped in the (white?) arillus.

Hab.—Tenasserim.—Fl. March.

6. **W. pubescens,** Kz.—An evergreen tree (25—30 + 8—10 + 1—3), all softer parts softly pubescent; bark a line thick, even, greenish-black, beset with rusty-coloured lenticels; leaves unpaired-pinnate, the terete rachis pubescent; leaflets in 4 pairs with an odd one, on a shorter or longer pubescent petiolule, ovate-oblong or oblong, sometimes somewhat unequal at the acute or rounded base, 3-5 in. long, shortly acuminate, entire and usually waved, membranous, softly yellowish pubescent beneath; flowers small, white, on short pubescent pedicels, forming long-peduncled pubescent brachiate corymbose panicles in the axils of the leaves and often longer than them; calyx pubescent; petals about a line long, pubescent outside; staminal tube cleft to about the middle; the filaments broad, quite glabrous, 2-cleft at the summit; berries globose or nearly so, the size of a very small cherry, glabrous, red, opening into 2 leathery valves, containing a single seed enveloped in a white arillus.

Hab.—Rather rare in the tropical forests along the eastern slopes of the Pegu Yomah and in the Martaban hills, up to 2,000 ft. elevation.—Fl. Feb.-March; Fr. Apr.—s.—SS.=SiS. Metam.

Remarks.—Wood soft, white.

CARAPA, Aubl.

Calyx 4- or 5-cleft or -parted, imbricate. Petals 4 or 5, free, imbricate. Staminal tube urceolate, 8-10-toothed or -cleft, the lobes entire or 2-parted; anthers included in the tube and alter-

nating with the teeth or lobes. Disk thick, hemispherical. Ovary 4-5-celled, each cell with 2 to 6 ovules superposed in 2 rows; style short. Capsule fleshy or woody, 1-5-celled (the thin septa often obliterating), 2-5-seeded. Seeds large, packed round the remains of the central axis, convex-angular, the testa spongy. Arillus none.—Trees, with abruptly or unpaired-pinnate leaves. Flowers usually in poor axillary panicles.

Flowers about 2 lin. across, 5-merous; leaflets in 2-3 pairs, more or less ovate, shortly bluntish acuminate . . . . . *C. moluccensis.*
Leaflets obovate to obovate-oblong in 2-1 pairs or solitary, retuse or rounded; flowers about 4 lin. in diameter, 4-merous . . *C. obovata.*

1. **C. moluccensis,** Lamk.—*Peng-lay-oang.*—A small evergreen tree, all parts glabrous; leaves abruptly or spuriously unpaired-pinnate, the rachis terete; leaflets in 2 or 3 pairs, ovate or ovate-oblong, usually a little oblique, bluntish or shortly bluntish acuminate, chartaceous (somewhat fleshy when fresh), very shortly petioluled, entire, glabrous; flowers small, about 2 lin. in diameter, on slender glabrous pedicels, forming slender lax panicles in the axils of the leaves and often as long as them; calyx 5-cleft, the lobes rotundate, acute; petals 5, nearly 1½ line long; staminal tube about 1½ lin. long, crenate; capsules the size of a small lime or smaller, globose, containing 2 or 3 large angular seeds.

Hab.—Not unfrequent along the rocky and sandy shores of the Andamans, especially along the western side.—Fr. Apr.-May.—l.—SS. = Sal.

2. **C. obovata,** Bl. (*C. moluccensis,* Bedd. Sylv. Madr. t. 136.) —*Peng-lay-oang.*—An evergreen tree (25—40 + 8—20 + 4—6), all parts glabrous; leaves abruptly pinnate, or occasionally simple, the smooth rachis brown or red; leaflets in 2 or a single pair, rarely the one or other solitary, obovate to obovate-oblong, narrowed at base, very shortly petioluled, rounded or retuse at the apex, 3-4 in. long, entire, fleshy-coriaceous when fresh, glossy on both sides; flowers rather small, nearly 4 lin. in diameter, on 3-4 lin. long thick pedicels, forming meagre short glabrous panicles or racemes in the axils of the leaves and shorter than them; calyx 4-cleft, the lobes rotundate; petals 4, about 2 lin. long; staminal tube 8-lobed; capsules globose, as large as a small shaddok or smaller, apiculate, containing 5 to 6 very large angular brown seeds.

Hab.—Frequent in the littoral forests, especially the tidal ones, all along the shores from Chittagong down to Tenasserim and the Andamans.—Fl. June-July; Fr. Apr.-May.—l.—SS. = Sal.

Remarks.—Wood pale or dark reddish-brown, broadly streaked, not very close-grained, rather heavy, strong. □′=47 pd. Good for handles of tools, hand-spikes, helves, spokes, &c., also for house-posts. The fruits used for tanning. Exudes a clear brownish brittle resin.

CHICKRASSIA, A. Juss.

Calyx cup-shaped, 4- or 5-toothed. Petals 4 or 5, imbricate. Staminal tube cylindrical, 8- or 10-crenate; anthers erect, inserted at the summit of the teeth. Disk none. Ovary shortly stalked, 3-celled with many biseriate ovules in each cell. Capsules woody, septicidally opening in three 2-lamellate valves separating from the 3-winged central axis. Seeds many, imbricate, winged below, compressed.—Large trees, with abruptly pinnate leaves. Flowers middling-sized, in terminal panicles.

Leaves and inflorescences glabrous; capsules greyish, wrinkled-rough . . . . . *Ch. tabularis.*
All softer parts and inflorescences softly pubescent; capsules black, almost smooth . . . . . *Ch. velutina.*

1. **Ch. tabularis,** A. Juss.; H.f. Ind. Fl. i. 568; Bedd. Sylv. Madr. t. 11.—*Yeng-ma* or *taw-yeng-ma.*—An evergreen tree (50—90 + 30—50 + 5—8), the young shoots slightly puberulous; leaves unpaired or spuriously abruptly pinnate, 1-2 ft. long, glabrous; leaflets alternate or nearly so, in 4 to 10 pairs, on a slender but rather short petiolule, obliquely ovate to ovate-oblong, long-acuminate, increasing upwards in size from 2 or 3 to 5 in. long, entire, membranous, glabrous; flowers middling-sized, greenish-white, on 1-2 lin. long minutely puberulous pedicels, forming minutely puberulous soon glabrescent terminal panicles; calyx puberulous, hardly a line deep; petals nearly ½ in. long, ovate-linear, indistinctly puberulous; ovary elongate, sparingly appressed tawny pubescent; the style very short; capsules oval, somewhat pointed, wrinkled-rough, the size of a pullet's egg, greyish-brown.

Hab.—Rather rare in the tropical forests of Chittagong and Pegu down to Tenasserim; also Andamans.—Fl. Sept.—s.—SS. = SiS.

Remarks.—Wood light-coloured, close-grained, elegantly veined, employed for furniture of various kinds. Usually called Chittagong wood. □′=24 pd.

2. **Ch. velutina,** Roemer.—*Yeng-ma* or *yimmah.*—A leaf-shedding tree (50—90 + 30—40 + 5—8), all softer parts softly pubescent; leaves 1-2 ft. long, softly pubescent, unpaired-pinnate; leaflets alternate, in 5-10 pairs with an odd one, oblong-lanceolate, rather oblique, shortly petioluled or almost sessile, 3-5 in. long, long-acuminate, chartaceous, entire, softly pubescent on both sides, more so beneath; flowers middling-sized, on tawny or rusty villous pedicels a line long, forming ample lax tawny tomentose panicles; calyx about ½ lin. deep, tawny tomentose; petals about ⅓ in. long, obovate-oblong, minutely velvety; ovary shorter than the style, densely tawny pubescent; capsules ovoid or almost globular, black and almost smooth, the size of a pigeon's egg, somewhat pointed.

Hab.—Frequent in the dry forests and entering also the upper mixed forests of Prome and Pegu; also Ava.—Fl. Sept.—l.—SS.=CaS. SiS. (?)

SOYMIDA, A. Juss.

Sepals 5, imbricate. Petals as many, twisted in bud. Staminal tube short, cup-shaped, 10-lobed, the lobes 2-toothed, anthers sessile between the teeth. Disk flat. Ovary 5-celled, with numerous pendulous biseriate ovules in each cell; style short. Capsule woody, septicidally opening into 5 bilamellate valves separating from the 5-cornered septum-bearing axis. Seeds pendulous, imbricate in 2 rows, compressed, marginate, at both ends produced into unequally long wings.—Trees, with abruptly pinnate leaves. Flowers small, in axillary and terminal panicles.

1. **S. febrifuga**, A. Juss.; H.f. Ind. Fl. i. 567; Bedd. Fl. Sylv. t. 8; Brand. For. Fl. 71.—A leaf-shedding tree (40—50 + 17—20 + 3½—5), all parts glabrous; leaves abruptly pinnate with a rather terete petiole and rachis; leaflets in 3-5 pairs, opposite, elliptical to elliptically ovate, on a petiole hardly a lin. long or almost sessile with an acute base, 2½-4 in. long, blunt or emarginate, rarely almost acute, chartaceous, glabrous; flowers small, greenish-white, on slender but short pedicels, forming glabrous ample panicles at the end of the branches and in the axils of the upper-leaves; petals about 2 lin. long; capsules ovate, 1-1½ in. long, glabrous.

Hab.—Found by Dr. Brandis somewhere in Burma, probably in Prome.—Fl. March-Apr.; Fr. Jul.-Aug.

CEDRELA, L.

Calyx 5-cleft or 5-sepalled. Petals 5, imbricate, contorted or rarely valvate at base. Disk thick, or raised and columnar, 4-6-lobed. Stamens free, 4-6, inserted on the summit of the disk, sometimes alternating with as many staminodes; anthers versatile. Ovary 5-celled, with 8-12 biseriate pendulous ovules in each cell; style filiform. Capsule 5-celled, septicidally opening into valves, leaving the dissepiments attached to the persistent axis. Seeds compressed, imbricate, winged below or on both ends.—Trees, with unpaired-pinnate leaves. Flowers small, panicled.

× Leaflets entire (seeds winged at both ends).
Leaflets usually on long slender petiolules; calyx minute, the sepals rounded . . . . . *C. Toona.*
Leaflets usually shortly petioluled; calyx large, the sepals 1½ lin. long, rather acute . . . . . *C. multijuga.*
×× Leaflets serrate or serrulate; calyx minute; seeds winged only below . . . . . *C. serrata.*

1. **C. Toona**, Roxb.; Bedd. Fl. Sylv. t. 10; Brand. For. Fl. 72, t. 14.—*Thit-kadoe.*—A tree (80—100 + 40—50 + 6—12), shedding

leaves in H.S., all parts glabrous; bark greyish-brown, about ½-⅔ in. thick, rather even, coarsely fibrous within; cut red; leaves unpaired-pinnate, glabrous; leaflets in 6 to 12 (sometimes increased to as many as 17) pairs, opposite or nearly so, on a rather long and slender petiolule, obliquely ovate-lanceolate or ovate-oblong, about 3-4 in. long, acuminate or cuspidate, more or less waved or entire, membranous, while very young puberulous on the nerves beneath; flowers small, white, slenderly pedicelled, forming large terminal glabrous panicles of about the length of the leaves or shorter; calyx glabrous, the lobes hardly ½ a lin. long, rotundate, blunt, ciliolate; petals about 3 lin. long; filaments puberulous, inserted in the cavities on the outside of the very thick pilose red lobes of the disk; capsules as large as a bean or somewhat larger, oblong, blunt, glabrous, 5-valved; seeds broadly winged at both ends and less so on the outer margin.

Hab.—In the tropical forests of the Pegu Yomah, rather rare, common in those of Martaban.—Fl. March-Apr.; Fr. Oct.-Nov.—s.—SS.=SiS. *Metam.*

Remarks.—Wood reddish, turning soon reddish-brown, with a silvery lustre, soft, fibrous, coarse, but rather close-grained. □′=28 pd.—Good for furniture, house-building, etc. Exudes an aromatic resin.

2. **C. multijuga,** Kz.—*Toung-da-ma.*—An evergreen tree (70—90+40—60+6—8), the trunk conspicuously buttressed at base, the young shoots minutely tawny puberulous; leaves up to 3 ft. long, unpaired-pinnate, the terete petioles and the 2-3 lin. long petiolules puberulous while young; leaflets in 12-15 pairs with an odd one, alternating, from ovate to oblong-lanceolate, somewhat oblique, unequal at base and rounded on one side, acuminate, 5-6 in. long, membranous, entire; flowers small, white, on ½ a line long pedicels, racemose, forming glabrous contracted panicles; petals and sepals 5 each, urceolate-converging, oblong-lanceolate, rather acúte, the latter 1½ to nearly 2 lin. long, minutely ciliolate; stamens 10, free; ovary with 10 furrows.

Hab.—Rather rare in the tropical forests of the eastern slopes of the Pegu Yomah, west of Tounghoo.—Fl. March.—s.—SS.—SiS.

3. **C. serrata,** Royle; Brand. For. Fl. 73.—A tree, all parts glabrous, or the young shoots minutely puberulous; leaves unpaired-pinnate, while young puberulous, soon glabrous; leaflets in 10-15 pairs, ovate- to oblong-lanceolate, on short but slender petiolules, especially at the unequal base more or less oblique, finely acuminate, serrate or serrulate, 3-4 in. long, membranous, glabrous, glaucous beneath; flowers small, white, on a lin. long pedicels, forming ample, glabrous, pendulous panicles; petals about 2 lin. long; capsules about an in. long, smooth; seeds broadly winged at one extremity only.

Hab.—Ava.

CHAILLETIACEÆ.

Flowers hermaphrodite or unisexual. Sepals 5, united or free, imbricate, sometimes unequal. Petals 5, free and equal, or connate and unequal, 2-cleft or 2-lobed. Stamens 5, alternating with the petals and adnate to their base, alternating with as many hypogynous glands or disk-lobes. Ovary free, 2-3-celled, with paired pendulous ovules in each cell; styles 2-3, free or united high up; stigma simple or capitate. Drupe dry or leathery, indehiscent or dehiscent, containing a 1-2-celled bony or crustaceous sometimes 2-parted stone. Seeds solitary, pendulous, with a broad hilum. Albumen none. Embryo large, with a small superior radicle.—Little trees or shrubs, with simple alternate leaves. Stipules usually petiolar. Flowers small, in axillary cymes or corymbs, the peduncle sometimes adnate to the petiole.

CHAILLETIA, DC.

Flowers regular or nearly so, sometimes polygamous or dioecious. Calyx 5-parted. Petals 5, free, broadly clawed, 2-parted or 2-lobed at the inflexed apex. Stamens 5, equal. Hypogynous glands 5, distinct or united. Ovary 2-3-celled; styles free or connate. Drupe coriaceous, dry, with a 1-2-celled stone.—Little trees or shrubs, with entire leaves. Stipules deciduous. Flowers small, in axillary cymes or corymbs.

× Nerves and net-veination beneath more or less conspicuous.

Cymes cluster-like and almost sessile; leaves green, cuneately narrowed in a very short petiole . . . . . *Ch. gelonioides.*

Cymes spreading, peduncled; (?) leaves dark-brown in a dried state *Ch. macropetala.*

×× Nerves and net-veination beneath very faint and almost impressed.

Cymes on 2-3 lin. long peduncles; leaves brown in a dried state, shortly petioled . . . . . *Ch. Helferiana.*

1. **Ch. Helferiana,** Kz.—An evergreen shrub or tree,(?) the younger shoots shortly yellowish or greyish pubescent; leaves elliptically oblong or oblong, on a 3-4 lin. long greyish pubescent petiole, acute or obtuse at base, shortly acuminate, entire, chartaceous, especially while young appressed pubescent along the midrib beneath and along the margins, the lateral nerves thin and inconspicuous; flowers small, on short greyish pubescent pedicels, forming a greyish pubescent small cyme on a ½ to ¾ in. long, thick, free peduncle arising from the axils of the leaves and about 2-4 times longer than the petiole; sepals and petals silky pubescent outside.

Hab.—Tenasserim.

2. **Ch. gelonioides,** H.f. Ind. Fl. i. 570.—An evergreen small tree, the young shoots puberulous; leaves elliptically to obovate-

lanceolate, narrowed into a very short petiole, abruptly to caudate-acuminate, 2-4 in. long, chartaceous, while young silky pubescent beneath, soon glabrous; flowers about 2 lin. in diameter, in small axillary cymes; sepals almost equal, blunt, appressed greyish pubescent; petals as long as the sepals, narrowly obovate, with a basal almost 4-sided scale, glabrous; anthers with a broad connective, in the females without pollen; drupe didymously and broadly oblong, somewhat compressed, about ¾ to 1 in. long, 2 or by abortion 1-celled, velvety.

HAB.—Chittagong.

3. **Ch. macropetala,** Turcz.; H.f. Ind. Fl. i. 571.—An evergreen shrub or tree, the branchlets pustular, the young shoots tawny pubescent; leaves elliptical to elliptically lanceolate, very shortly petioled, acuminate, silk-hairy beneath and on the nerves above, 3-4½ in. long, thin coriaceous; flowers about 2 lin. in diameter, in densely tomentose cymes; sepals united into a turbinate tube, unequal, blunt, appressed greyish pubescent; petals somewhat longer than the sepals (in the females twice as large), split to below the middle; stamens as long as the petals; the anthers in the females without pollen; scales of the disk 4-sided, crenate; ovary in the males rudimentary, in the females globular, white-hairy, the style long and slender, 3-cleft at the apex.

HAB.—Tenasserim.

OLACINEÆ.

Flowers regular, hermaphrodite, or rarely unisexual. Calyx small, 4-6-toothed, free or adnate to the disk. Petals 4-6, free or more or less united, valvate. Stamens as many or twice as many as (rarely fewer than) petals, adnate to the base of the petals or free and hypogynous; anthers 2-celled, versatile or rarely adnate. Disk free, or adnate to the ovary or to the calyx, rarely divided into scale-like glands. Ovary free or immersed in the disk, 1- or imperfectly 2-3-celled, with 2-3 or rarely a solitary pendulous ovule in each cell; style simple. Fruit usually an indehiscent drupe, either superior or (through the enlargement of the disk and calyx-tube) inferior. Seeds solitary, pendulous, or spuriously erect. Albumen present or none. Radicle superior.—Trees or shrubs, sometimes scandent, with usually alternate simple leaves. Stipules none. Flowers few and axillary, or in spikes or rarely in terminal panicles.

About 25 species are found in Burma, but little is known of their uses or timber. Nearly all are woody and find a place here.

* *Stamens twice as many as petals (rarely fewer), or if of the same number, opposite to them.*

○ Ovary often 2-3-celled at base, at least at the summit 1-celled. Placenta central, with 2 or 3 pendulous ovules.

× Stamens twice as many as petals, or, if fewer, accompanied by staminodes.

Calyx not enlarging after flowering; stamens all perfect . . . *Ximenia.*

Calyx enlarged in fruit; perfect stamens 3-5; staminodes 6 or fewer. . . . . *Olax.*

× × Stamens as many as petals and opposite to them. Staminodes none.

† Fruiting calyx much enlarged, adnate to the drupe.

Ovary 1-celled; scandent tendril-bearing shrub with 3-nerved leaves . . . . . *Erythropalum.*

Ovary to near the summit 3-5-celled; trees with penninerved leaves . . . . . *Strombosia.*

† † Calyx in fruit unchanged; disk in fruit much enlarged, adnate to the drupe and resembling an adnate calyx . . . *Anacolosa.*

○○ Ovary 1-celled, with a single ovule. Flowers hermaphrodite.

× Corolla gamopetalous. Inflorescence without bracts.

Stamens 4, alternating with as many hypogynous scales or glands *Cansjera.*

Stamens 4, free; staminodes or scales none . . . . . *Natsiatopsis.*

× × Petals free. Inflorescences while young imbricate-bracted.

Filaments filiform . . . . . *Opilia.*

∗ ∗ *Stamens as many as petals and alternating with them.*

○ Trees or erect shrubs. Cotyledons small or dilated.

† Calyx minutely toothed or lobed. Petals usually glabrous.

Drupes without fleshy appendage; anthers pendulous . . . *Stemonurus.*

Drupes with a fleshy puffy sarcocarp, covering only one-half of the boat-shaped nut; anthers attached to the back above the 2-lobed base . . . . . *Apodytes.*

Drupe berry-like; flowers sessile, in heads . . . . . *Daphniphyllopsis.*

† † Calyx 5-cleft, or the sepals distinct, imbricate.

Albumen many-lobed; drupes dry, woody . . . . . *Gonocaryum.*

○ ○ Climbers. Cotyledons broadly foliaceous or thick-fleshy. Flowers dioecious.

Female flowers in heads; filaments longer than the anthers; drupes villous or echinate; albumen slightly wrinkled . . . *Phytocrene.*

Flowers interruptedly spicate; filaments longer than the anthers. Albumen none . . . . . *Sarcostigma.*

Flowers racemose; filaments very short; albumen fleshy . . *Natsiatum.*

Flowers cymose-panicled; filaments very short; albumen fleshy . *Iodes.*

XIMENIA, L.

Calyx 4-5-toothed or -lobed, not enlarging after flowering. Petals 4 or 5, bearded inside, valvate. Stamens twice as many as petals; filaments filiform; anthers dehiscing by opposite slits. Ovary 3-celled at base, with 3 ovules suspended from a central placenta. Drupes with a very thick fleshy sarcocarp. Seeds spuriously erect.—Shrubs or rarely trees, often spinose. Flowers middling-sized, solitary, or in small axillary cymes.

1. **X. Americana**, L.; H.f. Ind. Fl. i. 574.—*Pin-lay-see* or *pin-lai-koo-yin.*—A straggling shrub, all parts glabrous, armed with

straight spines (reduced branchlets); leaves ovate or ovate-oblong, 1½-2 in. long, rather long petioled, acute at base, blunt, entire, glabrous; flowers whitish, rather large, forming little nodding cymes, rarely solitary or by 2-3; petals 3-4 lin. long, densely and long bearded inside; drupes oval-oblong, about an in. long or longer, red, smooth, edible, containing a large not very hard nut.

HAB.—Not unfrequent along the rocky coast of the Andamans; also Tenasserim.

OLAX, L.

Calyx truncate, enlarging after flowering, and more or less enclosingthe fruit. Petals 6, rarely 5, inserted to the free turbinate disk. Perfect stamens usually 3, alternate with the petals, the remaining 7-9 reduced to simple or 2-cleft staminodes. Ovary half-immersed in the disk, 3-celled only at base, with 3 ovules suspended from the central placenta; style more or less elongate. Drupes free, enclosed in the enlarged coriaceous or membranous calyx. Seed spuriously erect. Albumen fleshy.—Trees or shrubs, usually scandent, with alternate entire leaves. Flowers small, in axillary short racemes or spikelets, rarely solitary.

× Enlarged calyx in fruit membranous, dry.
Branchlets terete, together with the leaves beneath and the racemes, puberulous . . . . . *O. scandens.*
All parts, also the racemes, quite glabrous; branchlets cornered . *O. Zeylanica.*
× × Enlarged fruiting calyx coriaceous; branchlets terete; flowers 4-5 lin. long . . . . . *O. imbricata.*

1. **O. scandens,** Roxb.; H.f. Ind. Fl. i. 575; Brand. For. Fl. 75.—*Joung-lai-loo* or *lai-loo.*—A large scandent shrub, with scattered spines on the old stems, all the younger parts pubescent or puberulous, the branchlets terete; leaves oval or oblong, rather shortly petioled, blunt or bluntish apiculate, about 2-3 in. long, entire, more or less puberulous beneath, glabrescent; flowers small, white, shortly pedicelled, forming short axillary solitary puberulous racemes much shorter than the leaves; petals usually 5, rarely 6, half-way united by pairs by means of the adnate filaments so as to resemble 3 two-cleft petals, about 3-4 lin. long; staminodes 2-cleft at apex, glabrous; drupes almost globose or ellipsoid, the size of a large pea, enclosed in the membranous cup-shaped enlarged free calyx, apiculate, 1-seeded.

HAB.—Rather frequent all over Burma from Ava and Chittagong down to Tenasserim, in all deciduous forests, ascending also into the pine forests up to 3,500 ft. elevation.—Fl. Decb.-March.—l.—SS. = ∞ Sal.

2. **O. Zeylanica,** L.; H.f. Ind. Fl. i. 576; Bedd. Sylv. Madr. 60.—A large shrub, all parts glabrous, the branchlets angular while young, when adult marked by 2 sharp lines; leaves ovate-lanceolate, shortly petioled, 3-4 in. long, acute or obtuse at base, acumi-

nate, revolutely marginate, glabrous, often blackish-dotted beneath, the nerves and veins conspicuous; flowers small, white, on rather slender pedicels, forming short axillary glabrous racemes; petals about 2 lin. long; staminodes 2-cleft at apex; drupes the size of a pea, for more than one-half uncovered by the enlarged, cup-shaped, free, membranous calyx, apiculate, 1-seeded.

Hab.—Ava.

3. **O. imbricata,** Roxb.; H.f. Ind. Fl. i. 575.—A large arboreous climber, all parts glabrous, the branchlets terete; leaves oblong or ovate-oblong, 4-5 in. long, obtuse at base, on short strong petioles, acute, entire, coriaceous, glossy above, the nerves conspicuous beneath; flowers rather large, white, forming short, dense racemes in the axils of the leaves; petals 4-5 lin. long; filaments glabrous; staminodes 2-cleft at apex; drupes oval, perfectly enclosed in the globose, fleshy, when dry, leathery calyx of the size of a small cherry.

Hab.—Chittagong; Tenasserim.—Fr. Febr.

ERYTHROPALUM, Bl.

Calyx bell-shaped, enlarging after flowering, adnate at base, 5-cleft, the lobes short, almost imbricate. Petals 5, minute and scale-like, inserted below the alternating calyx-lobes. Stamens 5, inserted to the calyx-tube, alternating with the petals; filaments short; anthers erect, with a thick connective. Ovary half-immersed in the disk, 1-celled, containing 2-3 pendulous ovules; style very short; drupes quite enclosed in, and adnate to, the enlarged calyx, at apex marked by the scars of the calyx-limb, containing a crustaceous 1-seeded nut. Seed pendulous. Albumen fleshy. —Scandent glabrous shrubs, with 3-nerved entire leaves. Flowers small, cymose, some of the peduncles transformed into tendrils.

1. **E. scandens,** Bl.; H.f. Ind. Fl. i. 578.—A large woody scandent shrub, all parts glabrous; leaves ovate to ovate-oblong, about 4-6 in. long, almost peltate, long-petioled, 3-nerved at base, acuminate or acute, entire, glabrous, beneath glaucescent, the nerves in adult leaves conspicuous; flowers minute, on slender pedicels, yellowish-green, forming slender long-peduncled 2-cleft cymes in the axils of the leaves; calyx conspicuous, with 5 reflexed sepals; petals minute, semi-orbicular, fringed, white; drupes ellipsoid-oblong, stalked, crustaceous, glabrous, the size of a small plum, crowned by the scars of the calyx-limb.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Apr.—s.—SS. = *Metam.* SiS.

STROMBOSIA, Bl.

Calyx very shortly adnate, 5-cleft, almost imbricate, enlarging after flowering. Petals 5, valvate. Stamens 5, adnate to the petals and opposite to them; anthers dorsifix. Ovary half-immersed in the disk or resting on the same with a broad base, nearly to the summit 3-5-celled, containing 3-5 ovules suspended from the central placenta; style short. Drupes berry-like, formed by the enlarged calyx and containing a crustaceous or hard nut. Seeds suspended. Albumen fleshy.

1. **S. Javanica,** Bl.; H.f. Ind. Fl. i. 579.—A large evergreen tree, all parts glabrous; leaves oblong to ovate-oblong, 6-8 in. long, on a rather long and thick petiole, obtuse or rounded at base, acuminate, entire, coriaceous, somewhat glossy above; flowers small, greenish, forming little cymes in the axils of the leaves and much shorter than the petioles; drupes almost turbinate, the size of a plum, truncate and encircled with a prominent margin at the top, terminating in a pointed disk.

Hab.—Tenasserim.

ANACOLOSA, Bl.

Calyx minute, obscurely toothed, free, remaining unchanged and not enlarging. Petals 6, inserted on the margin of the disk. Disk adnate to the ovary, enlarging and adnate to the fruit. Stamens 6, inserted at the base of the petals and opposite to them; anthers adnate at the inner side, penicellate at tip. Ovary immersed in the disk, 1-celled or imperfectly septate, containing 2-3 pendulous ovules. Drupes berry-like, marked by the annular border of the adnate disk, and containing a crustaceous nut. Seed pendulous. Albumen fleshy.—Shrubs or small trees, with entire coriaceous leaves. Flowers small, cymose.

Calyx and pedicels densely puberulous; drupe scarlet, thinly velvety . . . . . *A. puberula.*
Calyx and slender pedicels glabrous . . . . . *A. Griffithii.*
As preceding, but the fruiting pedicels very thick; drupe an in. long, glabrous . . . . . *A. crassipes.*

1. **A. puberula,** Kz.; H.f. Ind. Fl. i. 581.—An evergreen tree (30—40 + 10—18 + 4—5), all parts glabrous; leaves oblong or ovate-oblong, 6-5 in. long, shortly petioled, acute at base, acuminate to bluntish, entire, coriaceous, glabrous; flowers small, on short straight puberulous pedicels arising from a conical or hemispherical short thick minutely bracted reduced peduncle in the axils of the leaves; calyx tawny puberulous; fruits obovoid, about $\frac{3}{4}$ in. long, scarlet, minutely velvety.

Hab.—Rather frequent in the tropical forests of the Andamans.—Fl. Apr.-May.—s.—SS.=SiS., Metam.

2. **A. Griffithii,** Mast. in H.f. Ind. Fl. i. 580.—An evergreen shrub or tree,(?) all parts glabrous; leaves oblong-lanceolate, 2-3 in. long, on a rather long petiole, obtuse or acute at base, blunt or bluntish acuminate, entire, coriaceous, glabrous, glossy above; flowers small, on straight, short, glabrous pedicels, forming an almost sessile short cyme in the axils of the leaves; calyx glabrous.

Hab.—Tenasserim.

3. **A. crassipes** (*Gomphandra crassipes,* Mast. in H.f. Ind. Fl. i. 587).—An evergreen tree (25—30 + 8—12 + 1—2), all parts glabrous; leaves lanceolate to oblong-lanceolate, acuminate at the base, on a thick petiole 4-5 lin. long, rather blunt, 5-7 in. long, thin coriaceous, glabrous, opaque, dark-coloured beneath; flowers small, on a line long pedicels, collected in very short glabrous few-flowered cymes of the length of the petiole; calyx coriaceous, cup-shaped, obsoletely toothed; unripe drupe obovate, on a very thick peduncle only 2-3 lin. long, at the base supported by the ruptured narrow calyx-limb, truncate at the top and terminated by a prominent acuminate disk.

Hab.—Rare in the tropical forests along choungs of the eastern slopes of the Pegu Yomah.—s.—SS.=SiS.

CANSJERA, Juss.

Flowers hermaphrodite. Calyx very minute and often undistinguishable at the base of the tubular or urceolate 4-lobed corolla. Stamens 4, more or less adhering to the base of the corolla and opposite to its lobes; filaments filiform; anthers almost globular-didymous. Disk 4-lobed. Ovary 1-celled, with a solitary ovule on a short central placenta; style filiform; stigma almost capitate. Drupes with a thin sarcocarp, containing a crustaceous nut. Seed erect.—Scandent shrubs, with alternate entire leaves. Flowers small, in nude spikes.

× Leaves puberulous, retuse or blunt, small . . . *C. parvifolia.*
× × Leaves glabrous.
Leaves oblong-lanceolate, acuminate, opaque; drupes oblong . *C. Rheedei.*
Leaves ovate-oblong, acute, glossy above; drupes globular . . *C. zizyphifolia.*

1. **C. parvifolia,** Kz.; H.f. Ind. Fl. i. 583.—Shrub, (?) all softer parts shortly pubescent or puberulous from forked hairs; leaves usually less than an in. long, ovate, rounded or obtuse at base, notched or blunt, coriaceous, entire, on a short shortly tomentose petiole, on both sides shortly pubescent; flowers small, sessile, form-

ing short spikes in the axils of the leaves; calyx more distinct than in other species; corolla puberulous.

HAB.—Tenasserim.

2. **C. Rheedei,** Gmel.; H.f. Ind. Fl. i. 582; Brand. For. Fl. 75; Bedd. Sylv. Madr. 179, t. 26, f. 6.—A scandent shrub, the younger branches puberulous; leaves from ovate to elliptically oblong, 4-5 in. long, shortly petioled, obtuse at base, acuminate, entire or somewhat waved, almost coriaceous, glabrous, opaque on both sides; flowers small, yellow, tubular, forming about an in. long tomentose spikes in the axils of the leaves; disk-lobes oblong-lanceolate, somewhat lacerate; drupes oblong, the size of a small pea, red, shortly pointed, glossy.

HAB.—Not unfrequent in the tropical forests of the Andamans and Tenasserim.—Fl. May.

3. **C. zizyphifolia,** Griff.—A scandent shrub, the shoots velvety; leaves ovate or ovate-oblong, 2-2½ in. long, on a short often puberulous petiole, obtuse at base, acute or shortly acuminate, entire, coriaceous, glabrous, glossy above, often 3-nerved shortly above the base and the nerves more arcuate; flowers small, green, subtended by a small bract, sessile, forming short velvety spikes in the axils of the leaves; corolla urceolate, papillose outside; disk-lobes from a broad cordate base lanceolate; drupes globular, red.

HAB.—Burma (probably Tenasserim).

NATSIATOPSIS, Kz.

Flowers dioecious, in elongate racemes. Calyx distinct, 4-toothed; corolla tubular, 4-cleft at the apex. Stamens 4; filaments broadly linear, flat, free. Ovary-rudiment tawny hispid.—Twining undershrubs, with leaves not unlike those of a *Thunbergia*. Flowers small, in elongate axillary fascicled racemes.

1. **N. thunbergiæfolia,** Kz.—A twining shrub, all softer parts minutely scabrous-pubescent; leaves cordate at the base, ovate-oblong, 5-6 in. long, very long petioled, shortly acuminate, repand-toothed, chartaceous, rough above, beneath densely pubescent, 7-nerved at the base; male flowers very shortly pedicelled, about 2 lin. long, forming elongate simple shortly tomentose racemes arising by 2 or 3 from above the axils of the leaves; calyx distinctly 4-cleft, pubescent; corolla gamopetalous, tubular, 4-lobed; the lobes short, reflexed, appressed pubescent outside; stamens 4; filaments long, broad-linear, free; ovary-rudiment densely tawny-hispid.

HAB.—Ava, Khakyen hills.—Fl. March.

OPILIA, Roxb.

Calyx minute, 4-5 toothed, not changed after flowering. Petals 4-5, hypogynous, valvate. Stamens as many, opposite to the petals; filaments filiform; anthers dorsifix near base. Disk of 4-5 scales. Ovary 1-celled with a solitary suspended ovule; style short. Drupe with a crustaceous nut. Seed spuriously erect. Albumen present.—Scandent shrubs, with entire almost distichous leaves. Flowers minute, by 1 to 3 subtended by a bract, forming axillary racemes, catkin-like while young.

1. **O. amentacea,** Roxb.; H.f. Ind. Fl. i. 583; Bedd. Sylv. Madr. 60, t. 9, f. 3.—A large scandent shrub, all parts glabrous; leaves ovate-lanceolate to lanceolate, on a 2-3 lin. long petiole, 3-4 in. long, bluntish acuminate, entire, coriaceous, glossy above, glabrous; racemes short, solitary, or by 2 or 3 in the axils of the leaves or above the scars of the fallen ones; flowers 5-merous, minute, yellowish, on a lin. long slender pedicels; drupes globular, the size of a cherry, 1-seeded.

Hab.—Not unfrequent in the mixed dry forests of the Prome District.—Fl. March; Fr. Apr.-May.—l.—SS.=CaS. Dil.

STEMONURUS, Bl.

Flowers usually polygamous. Calyx cup-shaped, minutely 4-5-toothed. Petals 4 or 5, inserted at the very short polygamous disk, more or less cohering in a tube, free at apex, valvate. Stamens 4 or 5, alternating with the petals and adhering to them at the base; filaments with 2 apical cavities hiding the pendulous anthers. Ovary 1-celled, with 2 pendulous ovules; stigma sessile. Drupes crowned by the cushion-shaped stigma, the nut crustaceous. Seed pendulous. Albumen fleshy.—Trees with entire leaves. Flowers small, cymose.

× All parts glabrous.

Leaves 2½-5 in. long; cymes leaf-opposite, the peduncle stiff and ½-1 in. long . . . . . *St. Penangianns.*

Leaves 2-3 in. long; cymes slightly puberulous, axillary and peduncled; drupes elliptically oblong, the putamen sulcate . *St. Javanicus.*

×× Younger branches tawny tomentose; petioles, undersurface of leaves, and inflorescence puberulous or tomentose.

Cymes peduncled, leaf-opposed . . . . . *St. tomentellus.*

1. **S. Penangianus,** Miers (*Gomphandra Penangiana,* Wall.; H.f. Ind. Fl. i. 587).—An evergreen tree, the leaf-buds slightly appressed-pubescent; leaves oblong, on a stout, short, petiole, acute at the somewhat unequal base, shortly acuminate, 2-5½ in. long, thin coriaceous, glabrous; flowers small, very shortly pedicelled, forming a trichotomously branched peduncled cyme opposite to the

leaves; calyx 4-5-toothed; corolla funnel-shaped, 4-5-cleft; stamens 4-5; the filaments hairy on the back. Ovary in males rudimentary, in females 5-angled, depressed at the apex, with a conical style; immature fruit ovoid, ½ in. long.

Hab.—Upper Tenasserim.

2. **S. Javanicus,** Bl. (*Gomphandra affinis,* Mast.; H.f. Ind. Fl. i. 587).—A small evergreen tree, the leaf-bud appressed fulvous-hairy; leaves obovate to elliptically oblong, on a rather slender petiole about ½ in. long, acute at the base, 2-4 in. long, bluntish and rather abruptly acuminate, coriaceous, glabrous; flowers small, shortly pedicelled, forming small shortly peduncled fugaceously puberulous dichotomous cymes in the axils of the leaves; calyx patelliform, almost truncate; corolla funnel-shaped, 2 lin. long; drupes oblong, ½ in. long, crowned by the incrassate peltate disk, the stone longitudinally furrowed.

Hab.—Tenasserim.

3. **St. tomentellus,** Kz. (*Gomphandra tomentella,* Mast. in H.f. Ind. Fl. i. 587.)—Probably an evergreen small tree, the shoots and young branchlets shortly tawny tomentose; leaves oblong to elliptically lanceolate, acute at base, on a rather long and slender petiole, 6-7 in. long, abruptly and bluntish acuminate, almost coriaceous, entire, beneath downy; flowers small, sessile, forming 3-4-tomous densely tomentose rather long-peduncled cymes in the axils of the leaves; calyx hirsute; corolla glabrous; filaments club-shaped upwards.

Hab.—Burma (probably Tenasserim).

APODYTES, E. Mey.

Calyx small, 5-toothed. Petals 5-6, valvate. Stamens 5-6, alternating with the petals and shortly cohering with their base; filaments rather thick, flattened upwards. Ovary often appendaged or thickened on the back, 1-celled, with 2 pendulous ovules; style excentrical, or oblique. Nuts dry, with a fleshy puffy appendage covering the whole inner flat side, 1-2-seeded. Albumen fleshy.—Small trees with entire leaves. Flowers small, cymose.

1. **A. Andamanica,** Kz.; H.f. Ind. Fl. i. 588.—An evergreen tree (40—50 + 10—15 + 4—6), the leaf-buds thinly puberulous; leaves oblong to elliptically oblong, obtuse or acute at the often somewhat oblique base, 7-8 in. long, rather shortly petioled, acuminate, coriaceous, glabrous, opaque; flowers small, white, almost sessile, collected into dense puberulous cymes on short thick peduncles in the axils of the leaves; calyx obsoletely 5- rarely 6-toothed, shortly pubescent; petals lanceolate with the acute tip incurved,

puberulous outside; style short, oblique; nut woody-fibrous, ovate-oblong, plano-convex, terminating in a reflexed point, the thick and puffy fleshy white appendage covering the whole flat inner face.

Hab.—Frequent in the tropical forests of South Andaman.—Fl. Apr.-May; Fr. June-July.—s.—SS.=SiS. Metam.

DAPHNIPHYLLOPSIS, Kz.

Calyx 5-lobed, accrescent. Petals 5, rarely 6-7, free. Stamens 10, all perfect, alternately or irregularly longer. Ovary inferior, pedicel-like, crowned with a rather large epigynous annular disk; style very short, simple. Fruit connate with the enlarged calyx, crowned by the hypogynous disk and calyx-lobes.—Trees with simple leaves. Flowers small, sessile, in axillary peduncled heads.

1. **D. capitata,** Kz.—A large evergreen tree (60—70+25—30+8—10), the shoots sparingly pubescent; leaves oblong or almost ovate-oblong, on a petiole about an in. long, thinly acuminate, rounded or obtuse at the usually oblique base, entire, coriaceous, 4-5 in. long, dotted, glossy above, beneath glaucescent and transversely veined and net-veined; flowers greenish-white, sessile with a pedicel-like ovary, forming axillary longer or shorter peduncled heads; calyx pubescent, the lobes minute, rounded, densely ciliate; drupes (unripe) obversely ovoid, about 3 lin. long, and sparingly pubescent.

Hab.—Rare in the damp hill forests of Martaban, east of Tounghoo, at 4,000 to 6,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

GONOCARYUM, Miq.

Flowers polygamous. Sepals 5, distinct, imbricate. Petals 5, cohering in a tube, free at apex, valvate. Stamens 5, alternating with the petals; the filaments high up adnate to the corolla-tube. Ovary of males imperfect, conical, in the females 1-celled, with 2 pendulous ovules; style short, thick. Drupe dry and woody. Seeds pendulous. Albumen divided into many tightly appressed lobes.—Glabrous trees with entire leaves. Flowers small, the males slender, the hermaphrodite-females in very short racemes or spikes.

Leaves opaque; drupes 4-3-angular	*G. gracile.*
Leaves glossy; drupes terete	*G. Griffithianum.*

1. **G. gracile,** Miq.; (*Phlebocalymna Wallichii,* Mast. in H.f. Ind. Fl. i. 590.—Probably an evergreen tree, all parts glabrous; leaves oblong or ovate-oblong, unequal and obtuse at base, about 5 in. long or longer, on about 5-6 lin. long petioles, bluntish apiculate, entire, very coriaceous, glabrous, opaque; flowers minute, sessile, the fertile hermaphrodites in short, the males in slender,

somewhat puberulous spikes in the axils of the leaves; calyx and ovary pubescent; style thick and short; drupes (in Sumatran specimens) all sterile, obovate, irregularly 4-3-angular, acuminate, smooth.

HAB.—Tenasserim.

2. **G. Griffithianum,** Kz., (*Phlebocalymna Griffithiana* and *Lobbiana*, Mast. in H.f. Ind. Fl. i. 590).—An evergreen tree (30—40 + 15—20 + 2—4), all parts glabrous; leaves elliptically or ovate-oblong, unequally acute or obtuse at base, 5-6 in. long, shortly and bluntish acuminate or apiculate, entire, coriaceous, shining above; flowers sessile, yellowish-white, 3 lin. long, tubular, the hermaphrodite ones forming very short glabrous racemes in the axils of the leaves; sepals 5, broad-ovate, acute, thick; petals acute; stamens 5; filaments as long as the tube and adnate to it; anthers ovate, acute; ovary puberulous; drupes about 2 in. long, oblong, obtuse, terete, woody, smooth, 1-seeded.

HAB.—Frequent in marshy places of the tropical and in swamp-forests of Southern Pegu down to Tenasserim.—Fl. Decb.-March.—s.—SS.=All. Metam. Lat. p.

PHYTOCRENE, Wall.

Flowers dioecious. Calyx cup-shaped, soon 3-4-lobed. Petals 4, hypogynous, somewhat cohering at the base, valvate. Males: Stamens 4, alternating with the petals; filaments filiform, very shortly united round the hispid ovary-rudiment; anthers versatile. Females: Staminodes minute. Ovary conical or cushion-shaped, 1-celled with 2 pendulous ovules; stigma almost sessile. Drupes woody, packed into large heads, villous or echinate, 1-celled and 1-seeded at the base. Albumen corrugate, many-cleft.—Large climbing shrubs, with large, entire or lobed leaves. Female flowers in solitary heads, male ones in little racemose heads forming large panicles.

Male flower-heads usually more tawny tomentose, on short but very thick pedunclets, numerous in very compound racemes, in a young state terminating in a short thick tomentose bract-like sterile axis . . . . . *Ph. gigantea.*

Male flower-heads somewhat smaller and usually greyish-tomentose, on short but slender pedunclets, few (8-5) in simple short racemes terminating in long bract-like greyish-tomentose slender axes . . . . . *Ph. bracteata.*

1. **Ph. gigantea,** Wall.; H.f. Ind. Fl. i. 591.—A large woody climber, the trunk often a foot thick, irregularly tubercled, all softer parts tawny or rusty-hirsute; leaves nearly a foot long, broadly ovate or ovate-oblong, deeply cordate at base, acuminate, entire, sometimes 3-lobed, with the lobes blunt or acute, thick-membranous, above, especially along the nerves, roughish puberulous,

and glossy, beneath softly greyish or pale tawny tomentose and laxly net-veined between the palmate nerves; male flowers sessile, in little greyish or tawny tomentose heads of the size of a small pea, forming short racemes supported by a long deciduous bract and collected in elongate large tawny or greyish-tomentose raceme-like panicles arising by 3-5 from the older branches; bracts subulate, about ½ in. long or longer, tawny pubescent, usually fallen before opening of the flowers.

Hab.—Not unfrequent in the tropical forests along choungs of the eastern slopes of the Pegu Yomah; more frequent in Tenasserim.—Fl. Febr.—s.—SS. = SiS. Metam.

N. B.—P. bracteata, Wall., is said to occur in South Tenasserim.

SARCOSTIGMA, WA.

Calyx cup-shaped, irregularly 4-5-toothed. Petals 4 or 5, adnate to the stalk-like torus and cohering in a short tube, free upwards, valvate. Males: Stamens 4-5, alternating with the petals and cohering with them at the base; filaments filiform; anthers versatile. Females: Ovary sessile beyond the corolla-tube, 1-celled with 2 pendulous ovules; stigma sessile. Drupes with a single almost woody nut. Albumen none.—Scandent shrubs, with coriaceous much net-veined leaves. Flowers minute, in long spikes.

1. **S. edule,** Kz.; H.f. Ind. Fl. i. 594.—A large woody climber, all parts glabrous; leaves oblong or elliptically oblong, rather shortly petioled, obtuse at base, very shortly and bluntish apiculate, coriaceous, entire, glabrous, strongly and elegantly net-veined on both sides; racemes rusty or tawny tomentose; drupes unequally oblong, somewhat compressed, blunt, densely and shortly tomentose, orange-coloured, with a thin edible sweetish pulp round the nut.

Hab.—Rather frequent in the tropical forests of the Andamans.—Fr. May-June.—SS. = SiS. &c.

NATSIATUM, Ham.

Flowers dioecious. Calyx 4-5-parted. Petals 4 or 5, coherent at base, valvate. Males: Stamens 4 or 5, alternating with the petals, inserted round the ovary-rudiment; filaments very short; anthers erect. Females: Ovary sessile, 1-celled with 2 pendulous ovules; style very short. Drupes with a single crustaceous nut. Albumen fleshy.—Large climbers with cordate leaves. Flowers minute, racemose.

1. **N. herpeticum,** Ham.; H.f. Ind. Fl. i. 595.—A large climber, all softer parts shortly hispid and retrorsely rough; leaves broadly cordate, on a long and slender petiole, 4-6 in. long and broad, shortly acuminate, obsoletely repand, minutely toothed by the

excurrent nerves, membranous, on both sides rough from minute stiff hairs; flowers minute, yellowish, on rather slender hirsute pedicels, at base furnished with a bract and forming long, slender, simple or rarely divided hirsute racemes usually arising above the scars of the fallen leaves or from the leaf-axils; calyx hirsute or villous; drupes the size of a pea, irregularly ovate, glabrous, black.

Hab.—Not uncommon in the tropical forests of the Pegu Yomah; also Chittagong.—Fr. Febr.-March.—s : l.—SS. = SiS.

IODES, Bl.

Flowers dioecious. Calyx 4-5-cleft, short. Petals 4 or 5, free, or at base united in a short tube, valvate. Males: Stamens 4 or 5, alternating with the petals, hypogynous round the ovary-rudiment and adnate to the corolla-tube; filaments very short. Females: Ovary sessile, 1-celled, with two pendulous ovules; stigma sessile. Drupes dry or fleshy, with a solitary crustaceous or bony nut. Albumen fleshy.—Scandent shrubs with entire leaves. Flowers small, cymose or panicled, the lower peduncles often reduced to tendrils.

× Flowers cymose-panicled.
Leaves on rather short thick petioles, softly tawny pubescent, beneath coriaceous; flowers almost sessile . . . . *I. tomentella.*
Leaves membranous, on slender rather long petioles, thinly puberulous beneath; flowers on slender about ½ lin. long pedicels. *I. Brandisii.*
× × Flowers in simple short cymes; leaves thin, membranous, slightly and shortly puberulous while young . *I. Hookeriana.*

1. **I. tomentella,** Miq.; H.f. Ind. Fl. i. 596.—An evergreen climber, all softer parts densely and softly tawny pubescent; leaves ovate- or elliptically oblong, somewhat narrowed at the rounded base, 6 in. long or longer, on a thick 4-6 lin. long densely tomentose petiole, mucronate-acute, entire, coriaceous, above along the nerves and the whole under-surface softly tawny pubescent, strongly transversely net-veined beneath between the prominent nerves; flowers minute, pubescent, almost sessile, forming rather dense densely tawny pubescent cymes arranged in elongate robust panicles arising by pairs from between the opposite leaves or more usually one of them reduced to a twisted tendril; calyx none; petals ½ lin. long, pubescent; anthers erect.

Hab.—Upper Tenasserim.—Fl. Febr.

2. **I. Brandisii,** Kz.; H.f. Ind. Fl. i. 596.—A climber, all softer parts thinly and shortly pubescent; leaves oblong, obtuse at base, on a rather slender pubescent petiole ½-⅔ in. long, 4-6 in. long, mucronate-acuminate, entire, thin-membranous, the nerves above and the whole under-surface thinly and minutely puberulous, green, prominently and laxly net-veined; flowers minute, pubescent, on

slender about ½ lin. long pedicels, forming lax cymes arranged in slender flexuose pubescent panicles arising by pairs from between the opposite petioles, sometimes the one or other panicle or branch of it reduced to a pubescent twisting tendril ; petals pale tawny hirsute, about ½ lin. long ; calyx none.

Hab.—Tenasserim, Thounggyeen.—Fl. March.

3. **I. Hookeriana,** Baill. ; H.f. Ind. Fl. i. 596.—A woody climber, the young shoots appressed tawny pubescent ; leaves ovate- to elliptically oblong, 4-6 in. long, obtuse or rounded at base, on a 3-4 lin. long appressed tawny hirsute petiole, cuspidate, entire or nearly so, membranous, much net-veined between the prominent, sparingly and shortly hairy nerves beneath, otherwise glabrous ; female flowers on short thick pedicels, forming rather short dichotomous pubescent leaf-opposed cymes ; corolla unequally 4-5-cleft, hirsute ; ovary ovoid-oblong, up to ½ densely tawny-setose, further up simply pubescent, 1-celled, with a solitary erect ovule ; drupes elliptically oblong, somewhat narrowed at base, about 1-1¼ in. long, glabrous, the pericarp fleshy ; seed solitary, erect.

Hab.—Chittagong.

ILICINEÆ.

Flowers regular, hermaphrodite or unisexual. Calyx 3-6-parted or- lobed, imbricate. Petals 4 or 5, rarely more or wanting, free or united at the base, hypogynous, imbricate. Stamens hypogynous, as many as petals or rarely more, free or slightly adhering to the petals ; filaments subulate ; anthers opening inwards. Disk none. Ovary free, 3-5- rarely many-celled, with 2 or 1 pendulous ovule in each cell ; style none or terminal ; stigma discoid or capitellate. Fruit a drupe containing a 2-5-celled stone or 4-8 crustaceous 1-seeded pyrenes. Testa membranous. Albumen copious, fleshy.—Trees or shrubs, with alternate simple leaves. Stipules none. Flowers small, in axillary and terminal cymes or clusters.

A small order differing from *Olacineæ* simply in the more-celled ovary, and from *Celastrineæ* in the absence of the disk and pendulous ovules. The berries of some are emetic, and the wood of *Ilex aquifolium* is much esteemed by European cabinet-makers. The Paraguay tea is the produce of *Ilex Paraguayensis* from South America.

Petals present ; ovary 4-8-celled ; stamens 5 . . . . *Ilex.*
No petals ; ovary 2-celled . . . . . *Daphniphyllum.*

ILEX, L.

Flowers often hermaphrodite. Calyx persistent, 4- or 5-cleft. Corolla rotate, 4-6-parted. Stamens as many or twice as many as

corolla-lobes, slightly adhering to the corolla-tube. Ovary 4-6-rarely 7-8-celled, with 1 or 2 ovules in each cell; stigmas as many as cells to the ovary, distinct or connate. Drupe globular, containing 4-8 bony or crustaceous pyrenes.—Trees or shrubs with entire or rarely toothed or spiny leaves. Flowers small, in axillary cymes.

* *Male inflorescence cymose, the female flowers clustered or solitary.*

Leaves cuneate-lanceolate, 2-3½ in. long, very opaque and brown beneath . . . . . *I. gaultheriæfolia.*

* * *Female flowers in simple or compound umbelets or cymes.*

× Cymes head-like contracted and small, on a long compressed peduncle . . . . . *I. Godayam.*

× × Cymes divaricately 2-cleft, on a rather short peduncle.

Cymes once divaricately 2-cleft; bark pale coloured . . . *I. macrophylla.*

Cymes twice or thrice dichotomously branched; bark white; stigma stout . . . . . *I. cymosa.*

As preceding, but stigma sessile . . . . . *I. Wallichii.*

1. **I. gaultheriæfolia,** Kz.—An evergreen shrub or tree (?), all parts glabrous; leaves linear-lanceolate, alternate, cuneate towards the base, on a short and thick petiole, acute, 3-3½ in. long, coriaceous, glabrous, serrate, the nerves beneath conspicuous; flowers minute, on slender glabrous pedicels, forming short, slender, glabrous axillary cymes of about the length of the petioles or somewhat longer; calyx 5-lobed, the lobes broadly oblong, bluntish; petals rotundate; stamens 5, on slender filaments.

Hab.—Tenasserim,

2. **I. Godayam,** Coleb.; H.f. Ind. Fl. i. 604.—An evergreen tree (30—50 + 15—20 + 2—4), all parts glabrous or the young shoots puberulous; bark an in. thick, dark-grey, rough; cut pale, sappy; leaves from oblong- to elliptically-lanceolate, on a glabrous, usually reddish petiole ½-⅔ in. long, 4-6 in. long, shortly and usually bluntish-acuminate, entire, when full grown coriaceous, glabrous, glossy dark-green above, beneath pale coloured; flowers white, on 1-3 lin. long rather slender puberulous or glabrescent pedicels, forming a small umbel at the bracted end of the compressed glabrous or puberulous 1-1½ in. long peduncles in the axils of the leaves or along the young leafless axillary branchlets; calyx glabrous or puberulous; the lobes rotundate, usually strongly or minutely ciliate; petals 4-5, rarely 6, oblong, blunt; stamens as many as petals, on filiform filaments; ovary glabrous, yellow; drupes globular, the size of a pepper-kernel, containing about 8 pyrenes, and in a dried state marked by as many furrows.

Hab.—Frequent in the tropical forests of Martaban and Tenasserim.—Fl. Febr.-Apr.—s.—SS.=Metam., Lat. p.

Remarks.—Wood whitish, turning grey, rather heavy, fibrous and tough, rather close-grained.

3. **I. macrophylla,** Wall.; H.f. Ind. Fl. i. 604.—An evergreen small tree 15 ft. high, all parts glabrous, the branchlets grey; leaves elliptically oblong, blunt, on a short petiole 3-4 lin. long, 4-7 in. long, quite entire, rather coriaceous, glossy above, the rather distant lateral nerves prominent; flowers shortly pedicelled, small, 4-6- merous, forming small 2-cleft glabrous or minutely puberulous cymes along the younger leafless branchlets and therefore appearing often racemose; calyx-lobes orbicular; petals broadly oblong, blunt; drupes globular, about 3 lin. in diameter, terminated by a sessile stigma, containing 6-8 much compressed sharply 3-gonous pyrenes.

Hab.—Tenasserim.

4. **I. cymosa,** Bl.; H.f. Ind. Fl. i. 605.—An evergreen small tree, all parts quite glabrous, the branchlets and bark pure white; leaves elliptical to elliptically oblong, on a rather strong petiole 3-4 lin. long, blunt or bluntish acuminate, 3-5 in. long, rather chartaceous, entire, pale coloured beneath, the lateral nerves beneath very thin; flowers 4-5-merous, small, on slender pedicels 3 lin. long, in small cymes or umbelets collected in a long-peduncled dichotomously branched cyme in the axils of the leaves or above the scars of the fallen ones; calyx-lobes orbicular; petals 4-8, unequal, erect, concave; drupes globular, about 2 lin. thick, terminated by a stout distinct style, grooved when dry, containing 8 trigonous compressed pyrenes.

Hab.—Tenasserim.

5. **I. Wallichii,** H.f. Ind. Fl. i. 605.—A shrub or tree (?), glabrous, the branchlets white; leaves elliptical or elliptically ovate, on a $\frac{1}{3}$ in. long petiole, blunt, quite entire, thinly coriaceous, 4-5 in. long, pale beneath, the lateral nerves very faint, spreading; drupes $\frac{1}{3}$ in. in diameter, terminated by a sessile stigma, containing about 12 compressed stones. (After Hooker.)

Hab.—Tenasserim.

DAPHNIPHYLLUM, Bl.

Flowers unisexual. Calyx 3-8-parted, the lobes persistent or deciduous, imbricate. Petals none. Hypogynous glands 4-6, rather large, or wanting. Stamens 5-18, central, on a convex receptacle; anthers opening by 2 slits. Ovary free, 2-celled, with 2 pendulous ovules in each cell; stigmas 2, sessile. Fruit a 1-seeded drupe. Seeds albuminous.—Trees or shrubs, with alternating and often crowded simple leaves. Flowers small, in axillary racemes.

Calyx deciduous; pedicels about 1-2 lin. long . . . . *D. Himalayense.*
Calyx persistent (?); pedicels about $\frac{1}{3}$ in. long . . . . *D. majus.*

1. **D. Himalayense,** Muell. Arg.—An evergreen tree (50—60 + 20—25 + 4—6), all parts glabrous; leaves oblong to ovate-lanceo-

late, on a 1½ to nearly 2 in. long petiole, acute at base, 3-4 in. long, acute or shortly acuminate, entire, chartaceous, glabrous, somewhat glaucescent beneath, on both sides (especially above) laxly net-veined; flowers on strong 1-2 lin. long pedicels, forming a short glabrous rather robust raceme in the axils of the leaves or above the scars of the fallen ones; anthers 5, dorsally compressed; calyx deciduous; drupes ellipsoid-oblong, about ⅓ in. long, smooth, on ⅓-⅔ in. long peduncles.

HAB.—Rather rare in the damp hill forests of the Martaban hills at about 5,000 ft. elevation.—s.—SS.=Metam.

2. **D. majus,** Muell. Arg.—All parts glabrous, the branchlets glaucous; leaves ovate-oblong to oblong, on a 2-3 in. long petiole, rounded or acute at base, 5-6 in. long, acuminate, entire, chartaceous, glabrous, glaucous beneath; flowers on about ½ in. long pedicels, forming a short glabrous axillary raceme; calyx apparently persistent in the males; stamens 8; the anthers laterally compressed; rest unknown.

HAB.—Tenasserim.—Fl. Febr.

CELASTRINEÆ.

Flowers usually hermaphrodite. Calyx small, 4-5-lobed or -parted, persistent, imbricate. Petals 4 or 5, imbricate. Stamens 3-5 (very rarely 2-10), inserted at the base of the disk or its lobes; filaments subulate, often short; anthers 2-celled. Disk conspicuous, cushion-like or explanate or lobed. Ovary sessile on the disk, free at the base or confluent with the disk, 3-5- (rarely 1-) celled, with usually 2 erect or rarely 1 or more ascending or suspended ovules in each cell; style simple, rarely 3-5-cleft. Fruit various, a capsule, berry, drupe, or samara. Seeds often arillate, sometimes winged. Albumen fleshy or almost horny, or none.—Trees or shrubs, sometimes thorny, rarely climbers, with opposite or alternate simple leaves often drying glaucous. Stipules very minute and deciduous or none. Flowers small or minute, in axillary cymes or racemes or in terminal panicles.

Most *Celastrineæ* are readily recognized by the peculiar large disk; from *Rhamnaceæ* they differ in having the stamens alternating with the petals. An order of little medicinal and economic value, but the timber of many of them when better known may be found serviceable for many purposes, especially for cabinet-work.

* *Stamens usually* 5 *or* 4 (*very rarely* 10), *inserted outside the disk or its borders; filaments usually incurved. Seeds albuminous.*

○ Capsules or follicles dehiscent.

\+ Ovules from the axis of the cells; leaves opposite.

Petals free; disk fleshy, broad; capsules 3-5-lobed and -celled . *Evonymus.*

Petals connate at base; disk none or annular; capsule 1-celled, 2-valved . . . . . *Microtropis.*

\+ + Ovules erect. Leaves alternate.

Capsules 2-4-celled, loculicidal . . . . . *Celastrus.*

Capsules entire or 2-lobed, 1-2-celled, follicle-like, and slowly 1- or 2-valved . . . . . *Kurrimia.*

○ ○ Fruit indehiscent.

Ovary superior, confluent with the disk; drupe containing a 1-3-celled putamen . . . . . *Elæodendron.*

Ovary half-inferior, 5-celled; berry large, containing many pyrenes . . . . . *Siphonodon.*

* * *Stamens* 3 (*rarely* 2-5), *inserted within or on the disk; filaments usually recurved. Albumen none.*

○ Fruit indehiscent, a berry, 1-many-seeded; seeds not winged . . . . . *Salacia.*

○ ○ Fruit capsular or samaroid, dehiscent; seeds winged.

Capsule 3-4-celled, loculicidal, angular; erect trees . . . *Lophopetalum.*

Ripe carpels usually 3, samaroid, 2-valved; scandent shrubs . . *Hippocratea.*

EVONYMUS, L.

Calyx 4-5-cleft, the lobes spreading or recurved. Petals 4 or 5, inserted round the disk, spreading. Stamens as many, inserted on the disk or rarely at its border; the filaments usually very short; anthers didymous. Disk fleshy, ample, broadly explanate, 4-5-lobed. Ovary immersed in the disk or confluent with it, 3-5-celled, with 2 or rarely more ovules in each cell, ascending at the interior angle; style short. Capsule 3-5-celled and-lobed, angular or winged, opening loculicidally in 3 to 5 valves bearing the septa on their middle. Seeds arillate. Albumen fleshy.—Trees or shrubs, with opposite, entire or serrate leaves. Stipules deciduous. Flowers small, in axillary cymes, rarely almost solitary. Arillus usually bright red.

× *Branchlets terete or only slightly 4-cornered.*

* *Capsules smooth.*

Flowers small, in dichotomous cymes; petals entire; capsules angular; leaves slightly serrate upwards . . . . . *E. glaber.*

Flowers nearly 5-6 lin. in diameter, in clusters or almost solitary; petals fringed; capsules obovate, sharply angular, on ½ to 1 in. long peduncles; leaves entire or obscurely serrate . . *E. Javanicus.*

Capsules globular, obtusely lobed, on very short peduncles or almost sessile; leaves entire . . . . . *E. calocarpus.*

* * *Capsules warty rough* . . . . . *E. sclerocarpus.*

× × *Branchlets 4-cornered and almost winged; capsules small* . . . . . *E. Griffithii.*

1. **E. glaber,** Roxb.; H.f. Ind. Fl. i. 609.—An evergreen tree (30—40 +10—20 + 2—4) with terete branchlets, all parts quite glabrous; bark about 2 lin. thick, rather smooth, grey; cut red; leaves obovate-oblong to oblong, shortly petioled, acute at

base, serrate towards the short rather blunt point, chartaceous, 3-6 in. long, glabrous; flowers 5-merous, small, 3-4 lin. in diameter, on short but slender pedicels, forming long-peduncled, slender, dichotomous cymes, either solitary in the axils of the leaves or almost racemose along the young axillary branchlets; petals white, entire, broadly oblong; disk green; capsule about 5-6 lin. long, obcordate, sharply 5-4-cornered.

Hab.—Chittagong; not unfrequent in the tropical forests of Martaban and Tenasserim; rare in those of the eastern slopes of the Pegu Yomah.—Fl. March-Apr.; Fr. Sept.—s.—SS.=Metam.

Remarks.—Wood of a brown-yellowish colour, turning brown, heavy, coarsely fibrous, rather close-grained, rather hard, but soon attacked by xylophages. Fine wood for furniture.

2. **E. Javanicus,** Bl.; H.f. Ind. Fl. i. 607.—An evergreen tree (30+10—12+1½—2) with terete branchlets, all parts quite glabrous; leaves elliptical, obovate-oblong to oblong, on a short but slender petiole, somewhat narrowed towards the acute base, shortly acuminate, entire or slightly serrate towards the point, 5-6 in. long, chartaceous, glabrous; flowers about 5-6 lin. across, on straight usually 6-8 lin. long (but often also much shorter or longer) strong pedicels, several together arising from short rusty-bracted tubercles, or almost solitary; petals oblong, long-fringed; stamens 5; the filaments inserted in the grooves of the disk-lobes; capsules pyriform or obovate, 5-10 lin. long, sharply 5-4-cornered, terminating in a sharp point or acuminate, smooth; the valves almost woody.

Hab.—Tropical forests of Tenasserim.—Fl. March.—s.—SS.=Metam.

Remarks.—Wood like that of the preceding species.

3. **E. calocarpus,** Kz.; H.f. Ind. Fl. i. 609.—A shrub or tree (?), with terete branchlets, all parts glabrous; leaves oblong or oblong-lanceolate, on a 3-4 lin. long petiole, shortly and bluntish-acuminate, entire, almost coriaceous, 4-6 in. long, pale beneath; capsules on very short glabrous peduncles or almost sessile, usually obsoletely 4-lobed and 4-valved, quite smooth, with a single red-arilled seed in each cell.

Hab.—Tenasserim.

4. **E. Griffithii,** Kz.; H.f. Ind. Fl. i. 611.—An evergreen shrub, with 4-cornered almost winged branches, all parts glabrous; leaves oblong-lanceolate or oblong, 2-3 in. long, on a very short petiole or almost sessile, obtuse at base, almost entire or obscurely serrate, acuminate, chartaceous, glabrous and smooth, pale beneath; flowers small, greenish white, on slender pedicels 3 lin. long, forming very slender dichotomous cymes in the axils of the leaves and much shorter than them; calyx broad, nearly 2 lin. in diameter, 4-lobed;

petals and stamens 4, the former about 2 lin. long, rotundate; ovary smooth, 4-lobed and -celled.

Hab.—Not unfrequent in the damp hill-forests of the Martaban hills, at 6,000 to-7,000 ft. elevation.—Fl. March-Apr.—s.—SS.=Metam.

5. **E. sclerocarpus,** Kz. (*Glyptopetalum sclerocarpum,* Laws. in H.f. Ind. Fl. i. 613).—An evergreen tree (8—12+3—5+1), the branchlets terete or compressed, all parts glabrous; bark red; leaves oblong- to elliptically lanceolate, on a 3-4 lin. long thick petiole, acuminate at both ends, 6-8 in. long, coriaceous, serrate; flowers greenish purple, on long slender pedicels, forming lax, glabrous, solitary or more usually clustered peduncled cymes in the axils of the leaves or above the scars of the fallen ones; sepals white, broadly semi-orbicular; petals almost concave-orbicular, green outside, purplish green inside; stamens 4; anthers sessile on the obsoletely 4-gonous green broad disk; stigma sessile, obsoletely 4-cornered; capsules more or less globular or 2-lobed, the size of a large pea, very rough from scurfy fissures and warts; arillus blood-red.

Hab.—Rather rare in the tropical forests around the Kambala in the Pegu Yomah.—Fl. & Fr. S.—SS.=SiS.

Remarks.—Wood white, soft, straightly and finely fibrous, close-grained.

MICROTROPIS, Wall.

Flowers sometimes unisexual. Sepals 5, imbricate, persistent Petals 5 (rarely none), more or less erect and united at base in a persistent ring, either free or confluent with the disk. Stamens 5. Disk annular or none. Ovary free, perfectly or imperfectly 2-3-celled, with 2 ovules in each cell. Capsule coriaceous, 1-celled, 2-valved, and slowly follicle-like dehiscing. Seeds solitary, erect. Albumen fleshy.—Glabrous shrubs or trees, with opposite entire leaves. Flowers small, in axillary cymes or clusters. Seeds usually red, the testa often arillus-like succulent.

Leaves wrinkled, especially above, and more coriaceous . . *M. longifolia.*
Leaves smooth, of a thinner texture.
Cymes dichotomous, on an 1-1½ in. long slender peduncle; leaves glossy above . . . . . *M. bivalvis.*
Cymes dichotomous and very short; the peduncles 3-5 lin. long; leaves opaque on both sides . . . . . *M. garcinifolia.*

1. **M. longifolia,** Wall.—An evergreen shrub (?), all parts glabrous; leaves oblong-lanceolate or oblong, on a thick 4-5 lin. long petiole, acute at base, 6-7 in. long, shortly acuminate, entire, coriaceous, opaque, on both sides (especially above) wrinkled; flowers in short cymes; peduncle 4-6 lin. long; capsules obovate, seeds red.

Hab.—Tenasserim.—Fr. Octob.

2. **M. bivalvis,** Wall.; H.f. Ind. Fl. i. 614.—A small evergreen tree, all parts glabrous, leaves lanceolate or oblong-lanceolate, acute at base, on a 3-4 lin. long petiole, shortly and bluntish-acuminate, 3-5 in. long, entire, thin coriaceous, especially above glossy, pale beneath; flowers small, on very short thick pedicels or almost sessile, supported by a minute bractlet, forming a small dichotomous cyme on slender 1-1½ in. long, axillary or lateral peduncles; sepals coriaceous, rotundate, with whitish borders; petals twice as long as the sepals (or wanting?); capsules about 4-5 lin. long, elliptically oblong, terminated by the short style, smooth.

Hab.—In the tropical forests of Tenasserim.—Fl. Febr.-Sept.; Fr. Octob. —s.

3. **M. discolor,** Wall.; H.f. Ind. Fl. i. 514.—An evergreen shrub, about 6-8 ft. high, all parts glabrous; leaves lanceolate or oblong-lanceolate, on a thick 3-4 lin. long petiole, acuminate at base, entire, shortly and finely acuminate, glabrous, opaque, pale beneath, somewhat coriaceous, 5-7 in. long; flowers small, whitish, soon turning yellowish, on very short thick pedicels or almost sessile, forming dense short cymes on 2-4 lin. long thick peduncles in the axils of the leaves or more frequently laterally; sepals coriaceous, rotundate; petals nearly 1½ lin. long; capsules oblong, the size of a small field-bean, smooth, 2-valved, 1-seeded, the seed oval, with a thin succulent-veined scarlet testa.

Hab.—Rather frequent in the damp hill-forests of Martaban and Tenasserim at 5,000 to 7,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

CELASTRUS, L.

Flowers sometimes unisexual. Calyx urceolate at base, 5-cleft. Petals 5, inserted round the disk. Stamens 5, inserted on the sinuses of the cup-shaped or concave 5-lobed disk; filaments subulate; anthers ovoid or oblong. Ovary free or confluent with the disk, 2-4-celled, with 2 erect ovules in each cell; style usually short. Capsule 2-4-celled and 2-4-valved, loculicidal. Seeds 1 or 2 in each cell, more or less completely arillate, rarely the arillus wanting. Albumen fleshy.—Trees or shrubs, often scandent, with alternate leaves. Stipules none or minute. Flowers small, in terminal or axillary panicles, racemes or cymes.

× Capsule 2-valved; cymes short and slender, axillary . . *C. acuminatus.*
×× Capsule 3-valved.
○ Cymes dichotomously branched, axillary . . . *C. montanus.*
○○ Cymes forming racemose panicles.
Raceme-like panicles terminal; leaves obovate; capsules several-seeded . . . . . *C. paniculatus.*
Raceme-like panicles axillary (and terminal); leaves elliptically lanceolate; capsules 1-seeded . . . . . *C. monospermus.*

1. **C. acuminatus,** Wall. (*Gymnosporia acuminata,* Wall.; H.f. Ind. Fl. i. 619.)—An evergreen shrub (?), unarmed, all parts glabrous; leaves lanceolate or oblong-lanceolate, on a 3-4 lin. long petiole, narrowed and acute at base, 5-7 in. long, shortly acuminate, crenate-serrate, chartaceous, glabrous; flowers minute, on long slender pedicels, forming short but very slender (almost capillary) glabrous dichotomous cymes arising solitary or by 2-4 from axillary or lateral short tubercles; calyx glabrous, 5-lobed; petals about ½ lin. long or somewhat longer; capsules 2-celled and 2-valved, obovate, somewhat compressed, the size of a small cherry, smooth, on ½ in. long or longer peduncles.

Hab.—Ava hills.—Fl. Apr.

2. **C. montanus,** Roxb. (*Gymnosporia montana,* Laws. in H.f. Ind. Fl. i. 621.)—A small usually crooked tree, armed with leaf- and flower-bearing spine-like reduced branches, or unarmed, all parts glabrous; leaves obovate, tapering at base, on a 4-5 lin. long slender petiole, blunt or almost emarginate with a minute mucro, minutely but rather sharply serrulate, membranous, glabrous, glaucous-green, 2-2½ in. long; flowers small, whitish, on slender pedicels, forming dichotomously branched glabrous cymes on 3-2 lin. long peduncles or almost sessile in the axils of the leaves; branchlets acute; petals about a line long; capsules small, turbinate, hardly 4 or 5 lin. long, opening in 3 valves, containing in each cell 2 small shining red seeds resting on a short white fleshy arillus.

Hab.—Burma, without locality—probably Prome.

3. **C. paniculatus,** Willd.; H.f. Ind. Fl. i. 617; Brand. For. Fl. 82.—A deciduous large scandent or spreading shrub, glabrous, or the shoots slightly puberulous; bark brownish grey, lenticellate; leaves broadly oval and ovate to obovate, on a rather long and slender petiole, 2-3 in. long, usually bluntish-acuminate or shortly acuminate, sometimes quite blunt, crenate-serrulate, glabrous or beneath puberulous; flowers small, yellowish, on slender puberulous or glabrous pedicels, forming puberulous or almost glabrous elongate raceme-like panicles at the end of the branchlets; calyx-lobes rotundate, ciliate, puberulous; petals about a line long, oblong-lanceolate; disk thin, free; capsules globular, the size of a small pea, 3-celled and 3-valved, each cell containing 1 or 2 yellowish seeds completely enveloped by the scarlet arillus.

Hab.—Not unfrequent from Ava to Pegu, in all leaf-shedding forests, especially the dry and open ones.—Fr. Sept.-Oct.—l.—SS.= ∞ *petrophilous.*

4. **C. monospermus,** Roxb.; H.f. Ind. Fl. i. 618.—An evergreen scandent shrub, all parts glabrous; leaves elliptical to oblong, acute or obtuse at base, on a 3-4 lin. long petiole, bluntish-acuminate,

2-4 in. long or longer, serrulate, coriaceous, glossy, drying blackish; flowers small, pale greenish yellow or white, very shortly pedicelled, in small cymes, forming axillary and terminal elongate raceme-like glabrous panicles; calyx-lobes rounded; petals rotundate, about a line long; disk flat, slightly 5-lobed; capsules the size of a cherry, 3-lobed-oblong, stylose-acuminate, smooth, 3-valved, containing a single seed entirely covered with an orange-coloured pulpy arillus.

Hab.—Ava hills.—Fr. March.

KURRIMIA, Wall.

Calyx 5-cleft, the lobes recurved. Petals 5. Stamens 5, inserted with the petals under the margin of the fleshy 5-lobed disk; filaments short; anthers didymous. Ovary immersed in the disk, free, 2-celled, with 2 basilar erect ovules in each cell; styles 2, filiform, twisted. Capsule 1- or 2-celled, entire or 2-lobed, slowly and follicle-like opening into 1 or 2 valves, 1-2-seeded. Seeds erect, enclosed in a fleshy arillus. Albumen plenty, fleshy.—Trees with simple leaves, faintly and elegantly transversely veined between the nerves. Stipules deciduous. Flowers small, in axillary simple or compound racemes.

Racemes simple; capsules ovoid-oblong, entire	*K. robusta.*
Racemes panicled; capsules 2-lobed at the apex	*K. paniculata.*

1. **K. robusta,** Kz. (*K. pulcherrima*, Wall.; H.f. Ind. Fl. i. 622).—*Kway-douk.*—An evergreen tree (60—70+30—40+8—12), all parts quite glabrous; bark $\frac{1}{3}$ in. thick, roughish, blackish brown; leaves oblong or oblong-lanceolate, obtuse or acute at base, on a $\frac{3}{4}$-$1\frac{1}{2}$ in. long petiole, entire, almost coriaceous or chartaceous, shortly acuminate or acute, 5-7 in. long, metallic-glossy; flowers small, greenish yellow, very shortly pedicelled, forming simple glabrous racemes either solitary or by 2-3 in the axils of the leaves and much shorter than them; calyx-lobes oblong; petals oblong, spreading; capsules ovoid-oblong, terete or nearly so, shortly and bluntish acuminate, an in. long or somewhat shorter or longer, follicle-like opening on one side only or into 2 valves, containing 1-2 large glossy-black seeds completely enveloped in a bright yellow, afterwards orange-coloured arillus.

Hab.—Rare in the tropical forests along the eastern slopes of the Pegu Yomah, but frequent in those of Martaban and Tenasserim; also Chittagong.—Fl. Febr.; Fr. Apr-Aug.—s.

Remarks.—Wood brown, heavy, fibrous and close-grained, brittle.

N. B.—*K. paniculata*, Wall., is said to occur in Tenasserim.

SIPHONODON, Griff.

Calyx 5-parted, the lobes rotundate. Petals 5, erect-spreading. Stamens 5, hypogynous; filaments complanate; anthers small. Ovary half-immersed in the base of the calyx, many-celled, the cells in 2-4 rows, 1-ovuled. Berry large, granular-fleshy and hard, containing numerous transversely superposed woody pyrenes adhering to the inner angle of the fruit. Seeds not arillate. Albumen almost horny.—Trees with alternate leaves. Stipules minute, deciduous. Flowers rather small, in axillary poor umbels.

1. **S. celastrinus,** Griff.; H.f. Ind. Fl. i. 629.—*Myouk-opshit.*—An evergreen tree (30—50+20—25+3—4), all parts glabrous; bark dark-grey, brittle, granular, rough from transverse short corky lenticels; cut dry, granular; leaves oblong or elliptically oblong, acute at the base, shortly petioled, acuminate, 5-6 in. long, crenate-serrate, chartaceous, glossy above, glabrous; flowers about 4-5 lin. in diameter, yellowish, on 2 lin. long thick pedicels, either solitary or by 2-4 on an 1-2 lin. long axillary peduncle, supported by minute bractlets; berries the shape and size of a small citron, elliptically obovoid to pyriform, on a cylindrical 4-6 lin. long peduncle, the pyrenes surrounded by the granular hard reddish-yellow endocarp.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban.—Fr. Jan.-May.—s.—SS.=Metam. SiS.

Remarks.—Wood pale yellowish, heavy, of a coarse unequal fibre, hard and rather brittle.

LOPHOPETALUM, Wight.

Calyx small, 5-lobed. Petals 5, crested or lamellate, fringed or entire. Stamens 5, inserted on the disk; anthers oblong. Disk broad and thick, more or less lobed. Ovary immersed in the disk and more or less free, pyramidally 3-angular, 3-celled, with 4-12 biseriate ascending ovules in each cell. Capsule almost woody, 3-celled, opening loculicidally into 3 valves. Seeds imbricate, broadly and elongate winged all round. Albumen none.—Trees with opposite leaves. Stipules minute, deciduous. Flowers small, in terminal and axillary corymb-like panicles or cymes.

* Petals fringedly crested on the upper side . . . . *L. fimbriatum.*
** Petals naked and entire.
Petioles an in. long or longer; panicles white, quite glabrous, stiff and short; petals 1½ lin. long . . . . . *L. Wallichii.*
As former, but panicles large and slenderly branched; flowers half as large . . . . . *L. littorale.*
Petioles 3-4 lin. long; panicles while young fugaceously rusty-tomentose . . . . . *L. floribundum.*

1. **L. fimbriatum,** Wight.; H.f. Ind. Fl. i. 615.—A tree, all parts quite glabrous; leaves elliptical to elliptically oblong, acute, on a ½ to 1 in. long rather slender petiole, more or less rounded at base, from 3-5 in. long, chartaceous or almost coriaceous, glabrous, in drying turning brownish beneath; flowers about 4 lin. in diameter, on 2-3 lin. long slender pedicels, forming lax, slender, peduncled cymes in the axils of the leaves; disk 5-lobed; petals obovate, narrowed at the base, long and elegantly fringed round the margins of the disk-lobes.

Hab.—Martaban and Tenasserim.—Fl. March.

2. **L. Wallichii,** Kz.; H.f. Ind. Fl. i. 615.—*Mong-taing.*—A tree (50—70 + 30—40 + 6—8), shedding leaves during H.S., all parts glabrous; bark about ⅔ in. thick, rather smooth, grey, soft; cut dark-red; leaves from elliptically to oval-oblong, on a ¾-1½ in. long petiole, rounded at the base, 4-6 in. long, blunt to acute, entire, glaucous-green, glossy above; flowers about 2-2½ lin. in diameter, on 1-1½ lin. long white pedicels, forming rigid greenish-white quite glabrous panicles in the axils of the leaves and at the end of the branchlets; petals greenish white, rotundate, naked and entire, in a dried state corrugate inside; disk large, fleshy, yellow, smooth, in a dried state wrinkled, the 5 deflexed stamens inserted on the same; ovary blood-red or crimson; capsules about 4 in. long or somewhat longer by 2 broad, 3-lobed and 3-valved, the valves smooth; seeds compressed, imbricate (including the wing), 2-2½ in. long, oblong, completely surrounded by the membranous wing.

Hab.—Common in the open, and more especially in the Eng forests all over Pegu and Martaban down to Tenasserim.—Fl. Jan.-March; Fr. March-Apr.—l. —SS.=*Lat.* Dil. Metam.

Remarks.—Wood pale, turning pale-brown, finely and rather loose-grained, hard, rather light, the annual rings very narrow, the heart-wood brown. Recommended for furniture.—W=□′ 33-38; break weight=121 pd.

3. **L. littorale,** Kz. (*Kokoona littoralis,* Laws. in H.f. Ind. Fl. i. 617).—*Mong-taing.*—An evergreen tree (40—60 + 15—25 + 5—7), all parts glabrous; leaves oval to oval-oblong, on a slender petiole ½-1 in. long, rounded at the base, blunt or somewhat acute, 3-5 in. long, coriaceous, entire, glaucescent beneath; flowers small, whitish, on slender about a line long pedicels, brachiate-cymose and forming rather large slenderly peduncled and branched glabrous panicles in the axils of the upper leaves and at the end of the branches; petals hardly a line long, rotundate, in a dried state more or less longitudinally corrugate; disk along the margin or wholly wrinkled in a dried state; capsules 2½-3 in. long, coriaceous, triquetrous, blackish brown, smooth, 3-valved; seeds 1½-2 in. long, oblong, compressed, broadly winged all round.

Hab.—In low lands inundated during R.S. of the Pazwoondoung river of Pegu; in Upper Tenasserim apparently frequent.—Fl. Feb.-March; Fr. March-April—l.—SS.=All., Arg.

4. **L. floribundum**, Wight.; H.f. Ind. Fl. i. 616.—An evergreen tree, about 35 ft. high, all parts glabrous; leaves lanceolate or oblong-lanceolate, on a 3-4 lin. long petiole, acute at the base, 3-4 in. long, acuminate or acute, somewhat waved, glabrous, coriaceous, glaucous-green and almost opaque above, somewhat glossy beneath, the nerves rather prominent; flowers nearly 3 lin. in diameter, on ½-1 lin. long rusty-villous glabrescent pedicels, forming very fugaceously rusty-tomentose, slender, axillary and terminal panicles at the end of the branchlets; sepals and petals rotundate, the latter about a line long, naked and entire.

Hab.—South Tenasserim, in dense forests.—Fl. Decb.

HIPPOCRATEA, L.

Calyx small, 5-parted. Petals 5, valvate or imbricate. Stamens 5 (usually 2 or 3 of them reduced), the filaments recurved or reflexed; anthers didymous, 2-4-celled, opening outwardly. Disk conical, cup-shaped, or broadly explanate. Ovary free or confluent with the disk, 3-celled, each cell with 2-4 biseriate ovules attached to the axis. Ripe carpels 3, united at the base, compressed, opening into 2 valves or indehiscent, few-seeded. Seeds compressed, usually winged at the lower end. Albumen none.—Little trees or shrubs, usually scandent, with opposite leaves. Stipules small, deciduous. Flowers small, in axillary panicles or cymes.

* *Petals imbricate in bud.*

Petals hardly ½ lin. long; sepals whitish marginate; leaves glaucous-green . . . . . *H. Indica.*

Petals about a line long; sepals erose-ciliolate; leaves blackish in drying . . . . . *H. fuscescens.*

* * *Petals valvate in bud.*

Calyx minute, puberulous; stamens 3 . . . . . *H. macrantha.*

1. **H. Indica**, Willd.; H.f. Ind. Fl. i. 624; Brand. For. Fl. 83.—A large scandent shrub with terete branchlets, all parts glabrous; leaves obovate-oblong or obovate-lanceolate, shortly petioled, acuminate or apiculate, 2½-3 in. long, membranous or chartaceous, remotely serrulate, glaucous-green, glabrous; flowers minute, greenish, on a lin. long slender pedicels, forming slender, glabrous, minutely and acutely bracted cymes or cymose panicles on 1-1½ in. axillary peduncles much shorter than the leaves; calyx minute, the lobes whitish bordered; petals imbricate in bud, hardly ½ line long; carpels 3, or fewer by abortion, flat, elliptically-oblong, blunt, about 2 in. long, striate, each containing 2 long-winged seeds.

Hab.—In the open forests of Toukyeghat in Martaban, rather rare.—Fl. Apr.—l.—SS.=Lat., Metam.

2. **H. fuscescens**, Kz.—A scandent shrub? all parts glabrous; leaves oblong-lanceolate or oblong, acute at the base, on a 4-5 lin. long thick petiole, shortly acuminate, 2½-3 in. long, coriaceous, obsoletely crenate-serrate, glabrous, glossy above, turning blackish or dark-brown in drying; flowers about 2 lin. in diameter, on 1-1½ lin. long pedicels, cymose, forming glabrous shortly peduncled or already from the base branched panicles in the axils of the leaves and somewhat shorter than them; sepals minutely erose-ciliate; petals obovate-oblong, concave, narrowed towards the base, about a lin. long, imbricate in bud; anthers 3, on very short reflexed filaments arising from the raised disk.

HAB.—Tenasserim.

3. **H. macrantha**, Korth.—A scandent shrub, the branchlets marked with 4 decurrent lines, all parts glabrous; leaves oblong or elliptically oblong, obtuse or almost rounded at the base, on a 4-5 lin. long petiole, apiculate or shortly and bluntish acuminate, more or less bluntish crenate-serrate, almost coriaceous, 3-5 in. long, glabrous; flowers about 3-4 lin. in diameter, on 2-3 lin. long thick shortly puberulous pedicels, forming minutely puberulous short-bracted longer or shorter (1-1½ in.) peduncled cymes in the axils of the leaves and much shorter than them; calyx minute, puberulous; petals oblong-lanceolate, minutely puberulous outside, valvate in bud; stamens 3; carpels 3, or fewer by abortion, about 3-4 in. long, elongate-oblong, flat, blunt, each containing 4-3 long-winged brown compressed seeds.

HAB.—Tropical forests of Chittagong; Tenasserim.—Fr. H.S.

SALACIA, L.

Calyx small, 5-parted. Petals 5, imbricate in bud. Stamens 3 (very rarely 2 or 4), inserted in the disk near the ovary, free or united with the ovary; filaments conniving and recurved at the apex; anthers small, the cells distinct or confluent, dehiscing longitudinally or transversely. Disk thick, conical or explanate. Ovary immersed in the disk, 3-celled, each cell with 2 or more ovules in a single or double series along the axis. Fruit a berry, 1-3-celled, pulpy, the pericarp coriaceous or almost woody, the cells 1-4-seeded. Seeds usually angular, not winged.—Scandent often arboreous shrubs, rarely erect, with usually opposite leaves. Stipules none. Flowers small, solitary, or few or more, commonly in axillary clusters or cymes, rarely panicles.

× Cymes peduncled and dichotomously branched, usually short.

Branchlets terete; pedicels thick, 6-8 lin. long; sepals not ciliate . *S. longifolia.*

Branchlets angular and marked by 3 decurrent raised lines; pedicels c. 4 lin. long, slender, arising from the globular rusty-bracted ends of branchings; sepals ciliate . . . . *S. tortuosa.*

× × Cymes sessile, *i. e.*, the pedicels arising directly from a tubercle or wart.
○ Petals about 3-4 lin. long; pedicels 2-3 lin. long, thick. *S. grandiflora.*
○ ○ Petals less than 2 lin. long; filaments very short and complanate.
† Leaves turning brown or blackish in drying.
Branchlets dark-brown, densely corky-lenticellate; leaves entire . *S. verrucosa.*
Branchlets pale coloured, sparingly lenticellate; leaves serrate . *S. Roxburghii.*
† † Leaves turning yellowish or pale-green in drying.
+ Berries by abortion 1-celled and 1-seeded . *S. prinoides.*
+ + Berries several-seeded.
Leaves lanceolate; pedicels 1-1½ lin. long . . . . . *S. flavescens.*
Leaves ovate-lanceolate; pedicels numerous, longer than the petiole . . . . . *S. multiflora.*

* *Cymes peduncled, usually short.*

1. **S. longifolia,** Wall. (*S. floribunda,* Wight; H.f. Ind. Fl. i. 629).—A large scandent shrub, the branchlets terete or slightly compressed, minutely tubercled, all parts glabrous; leaves oblong or oblong-lanceolate to lanceolate, acute or obtuse at the base, on a 5-6 lin. long petiole, apiculate or bluntish acuminate, 4-5 in. long, almost coriaceous, more or less serrate-toothed, glabrous, glossy, dark-colouring in drying; cymes as long or much longer than the petioles, on ½ an in. long peduncle, glabrous, once or usually twice dichotomous; flowers small, greenish, on 6-8 lin. long thick pedicels, at base subtended by broad minute bractlets; sepals rotundate, small, entire; petals sessile, rotundate, about ½ a line long; anthers 3, on very short dilated reflexed filaments; berries obovoid or almost globose, the size of a cherry, smooth, 2-celled and 2-seeded.

Hab.—Tenasserim.—Fr. Jan.

2. **S. tortuosa,** Griff.—A large scandent shrub, all parts glabrous, the branches angular and minutely lenticellate, the branchlets more or less compressed; leaves oblong-lanceolate or lanceolate, acute at the base, on a 3-4 lin. long petiole, 4-6 in. long, bluntish or bluntish and shortly acuminate, obsoletely crenate-serrate, chartaceous, glabrous, turning brownish in drying; cymes short and stiff, on a 3-4 lin. long peduncle, the dichotomous branchings much shortened and terminating in a dense head of rusty-coloured much-fringed bractlets from among which the terete 4-6 lin. long slender pedicels arise; flowers minute, hardly 2 lin. in diameter; sepals much imbricate and almost erect, more or less densely fringed; petals about ⅔ lin. long, oblong, bluntish; stamens 3, the connective broad; filaments short, straight, terete; ovary 3-celled, the cells 2-ovuled.

Hab.—Tenasserim.—Fl. Jan.-March.

* * *Cymes sessile, i. e., the pedicels arising directly from a tubercle or wart.*

3. **S. grandiflora,** Kz.; H.f. Ind. Fl. i. 626.—A scandent shrub, all parts glabrous, the branchlets more or less terete, brown; leaves elliptically oblong or oblong, acute at the base, on a very thick ½-¾ in. long petiole, apiculate, entire, and the margins slightly revolute, 8-9 in. long, almost coriaceous, glossy on both sides, glabrous, turning brown in drying; flowers conspicuous, on thick about 2 lin. long pedicels, arising by 2-4 from axillary or lateral minutely bracted tubercles; sepals broadly rotundate, glabrous, about a line long; petals sessile, rotundate, about 3-4 lin. long; stamens 3, inserted inside the disk; anthers on very short dilated and reflexed filaments; ovary smooth; style short.

Hab.—Tenasserim.

4. **S. verrucosa,** Wight.; H.f. Ind. Fl. i. 628.—A large scandent shrub, all parts glabrous, the branches rarely terete or obscurely 3-angular and (along with the more or less compressed branchlets) very rough from numerous small corky lenticels; leaves elliptically or oblong-lanceolate, acute at the base, on a thick 3-5 lin. long petiole, rather shortly and bluntish acuminate, 4-6 in. long, obsoletely and bluntish serrate, almost coriaceous, glabrous, glossy above, turning brownish in drying; flowers numerous, small, on slender about 6-7 lin. long pedicels arising from axillary or lateral brownish densely bracted tubercles; sepals rounded, entire; petals about a line long, oblong, blunt; disk annular, thick; anthers 3, on very short dilated reflexed filaments; ovary obscurely 3-angular, smooth; berries obovoid or almost globular, (unripe) the size of a bullet, with a thick coriaceous skin as in *S. Roxburghii,* 3-celled, with a single large seed in each cell.

Hab.—Frequent in the tropical forests of Martaban and Tenasserim.—Fl. Jan.-March; Fr. Apr.—s : l.—SS.=Metam.

5. **S. Roxburghii,** Wall.; H.f. Ind. Fl. i. 627.—A lofty woody climber, all parts glabrous, the stem about 1½ ft. in girth, the older branchlets sparingly sprinkled with pale-coloured lenticels; bark 2 lin. thick, dark-grey, rather smooth; cut red; leaves lanceolate or oblong-lanceolate, acute at the base, 4-5 in. long, on a 2-3 lin. long petiole, bluntish apiculate, entire or nearly so, almost coriaceous, glabrous, glossy above, turning brown or blackish in drying; flowers usually numerous, yellowish green or of a deep greenish-orange colour, on slender 6-8 lin. long pedicels arising from a bracted globular tubercle in the axils of the leaves; sepals short, rounded, ciliolate; petals sessile, rotundate, nearly a line long; stamens 3, the anthers on very short dilated and reflexed filaments; berries almost globose, the size of a small lime or smaller, dull-red, with a thick skin surrounding a soft gelatinous edible pulp, 2-3-celled, with a solitary large seed in each cell.

Hab.—Not unfrequent in the tropical forests of Martaban and Tenasserim; also Chittagong.—Fl. March.—s : l.—SS.=Metam.

Remarks.—Wood reddish, the annual rings purplish.

6. **S. prinoides,** DC.; H.f. Ind. Fl. i. 626.—A straggling small tree or rather large half-scandent shrub, all parts glabrous, the branchlets smooth, grey, more or less 4-cornered; leaves lanceolate to oblong-lanceolate, acute at the base, on a slender petiole 4-5 lin. long, shortly and bluntish acuminate, about $1\frac{1}{2}$-3 in. long, crenate-serrate, coriaceous, glossy above, turning glaucescent in drying; flowers small, dull yellowish green, on 4-6 lin. long rather straight pedicels, several together arising from an axillary tubercle; calyx-lobes rotundate, more or less puberulous along the borders; petals about a line long, broadly obovate or almost rotundate, contracted in a short claw, waved or almost entire; anthers 3, on short but slender terete filaments arising from the inner margin of the cup-shaped fleshy disk which almost completely encloses the 3-celled ovary already before fœcundation; berries globose or nearly so, the size of a small cherry, red, glossy, with a thin skin, sappy, by abortion 1-celled and 1-seeded.

Hab.—Frequent in the tidal forests all along the coast from Chittagong and Pegu down to Tenasserim and the Andamans.—Fl. Jan.; Fr. March-June.

7. **S. flavescens,** Kz.; H.f. Ind. Fl. i. 625.—A scandent shrub (?), all parts glabrous; leaves lanceolate, opposite or alternate, on a 3-4 lin. long, thick petiole, acuminate at both ends, entire or obscurely serrate, with the borders slightly revolute, thin coriaceous, 4-5 in. long, glabrous, glossy above, pale beneath, turning yellowish in drying; flowers minute, white, on 1-2 lin. long pedicels, arising from minutely bracted tubercles in the axils of the leaves or laterally; sepals oblong-lanceolate, bluntish; petals $\frac{3}{4}$ lin. long, oblong, blunt; anthers 3, on very short dilated filaments; ovary smooth.

Hab.—Tenasserim.

8. **S. multiflora,** Wight.; H.f. Ind. Fl. i. 627.—Shrubby, glabrous; leaves broadly ovate-lanceolate, rounded at the base, slightly acuminate and blunt at the apex, coriaceous, quite entire, with the margins slightly revolute, 8-10 in. long by 4 broad, turning paler green in drying; pedicels numerous, from axillary tubercles, longer than the petioles; calyx deeply 5-cleft; petals orbicular; anther-cells placed transversely across the apex of the filament and opening outwards; ovules about 8 in each cell, in 2 collateral rows.—(After Wight.)

Hab.—Tenasserim.

RHAMNACEÆ.

Flowers regular, hermaphrodite, or rarely polygamous. Calyx 4-5-lobed or -cleft, the tube persistent and often adnate to the ovary or disk, valvate. Petals 4 or 5, alternating with the calyx-lobes, or none. Stamens 4 or 5, opposite to the petals if present; filaments filiform, rarely dilated; anthers small, often included in the petals, rarely exserted. Disk rarely wanting, usually filling the calyx-tube or lining it, or annular, rarely cup-shaped and free. Ovary more or less inferior, 3- (or rarely 2- or 4-) celled, with a solitary erect ovule in each cell; style short, with as many lobes as cells to the ovary. Fruit a drupe or capsule, the margin of the adnate calyx-base forming a ring at the base or round or at the summit of the fruit, the endocarp separating into as many cocci as cells, or forming a woody or bony 2-4-celled stone. Seeds solitary, erect, often arillate. Albumen fleshy or almost horny, rarely wanting.—Trees or shrubs, often climbing, very rarely herbs, with usually alternate simple leaves. Stipules usually present, but very deciduous, rarely spiny and persistent. Flowers small or minute, in cymes or umbel-like clusters, often collected in axillary or terminal compound cymes, racemes, or panicles.

A well-marked family, easily recognised from the allies by the stamens opposite the petals, from *Ampelideæ* by the drupaceous or capsular (never berried) fruit, the seed, and generally by the habit. The fruits of some *Rhamni* are violently purgative, while others yield good dyes, and those of some species of *Zizyphus* are edible. Only few of the species yield timber, which is only small.

* *Drupe containing a solid* 1-3-*celled putamen. Ovary superior or half superior.*
× Drupe 1-celled and 1-seeded; leaves penninerved.
○ Nut produced in a long terminal wing, indehiscent . . . . . *Ventilago.*
○ ○ Nut wingless.
Nut indehiscent, nearly entirely enclosed in the enlarged adnate calyx-tube . . . . . *Apteron.*
Capsule lanceolate or urn-shaped, 2-valved . . . . . *Smythea.*
× × Drupes with a 1-3-celled putamen.
Leaves palmately 3-5-nerved . . . . . *Zizyphus.*
Leaves penninerved . . . . . *Berchemia.*
* * *Fruit dry or drupaceous, containing* 3 *(rarely* 2-4) *indehiscent or* 2-*valved cocci.*
○ Fruit not winged, terete or nearly so.
× Leaves opposite or nearly so.
Flowers in fascicles or small umbelets . . . . . *Scutia.*
Flowers in terminal panicles . . . . . *Sageretia.*
× × Leaves alternate; ovary confluent with the disk *Colubrina.*
○ ○ Fruit usually 3-winged or 3-cornered; flowers spicate-racemose; leaves alternate . . *Gouania.*

VENTILAGO, Gaertn.

Calyx 5-cleft, the tube obversely conical. Petals 5, hood-shaped, deflexed. Stamens 5, adnate to the base of the petals, the connective usually excurrent. Disk 5-cornered, flat, filling the calyx-tube. Ovary immersed in the disk, 2-celled; style very short with 2 stigmas. Nut almost globular, at the base or to the middle enclosed in the calyx-tube, 1-celled and 1-seeded, at the summit produced in a long wing. Albumen none.—Scandent shrubs with alternate penninerved leaves. Stipules very minute, deciduous. Flowers small, in terminal or axillary panicles.

* *Fruiting calyx very short, surrounding only the very base of the nut;* inflorescence tomentose . . . . *V. Maderaspatana.*

** *Fruiting calyx adnate to the middle of the nut, and forming here a prominent ring.*

Flowers racemose-panicled, like the whole inflorescence tomentose; fruits shortly, but densely puberulous . . . . . *V. calyculata.*

Flowers glabrous, in axillary clusters, forming terminal, leafy, glabrous racemes; fruits quite glabrous and glossy; calyx-ring at the middle of the nut; nut 3 lin. thick, the wing rounded . *V. leiocarpa.*

As former, but nut nearly ½ in. thick, the calyx-ring basal, the wing shortly acuminate . . . . . *V. Maingayi.*

1. V. Maderaspatana, Gaertn.; H.f. Ind. Fl. i. 631; Brand. For. Fl. 96.—A scandent shrub, thinly and shortly puberulous or glabrescent; leaves ovate-oblong to oblong-lanceolate, on short but slender puberulous petioles, bluntish and shortly acuminate, coarsely but obsoletely crenate-serrate, almost coriaceous, 1-2½ in. long; flowers minute, greenish, on slender puberulous pedicels, in short clusters arranged into racemes forming shortly tomentose terminal panicles; calyx about 1½ lin. in diameter; nuts the size and shape of a pea, at the base surrounded by the comparatively short calyx, shortly puberulous, terminating in an elliptically oblong 1 in. long wing.

Hab.—Tenasserim, from Moulmein down to Mergui.

2. V. calyculata, Tul.; H.f. Ind. Fl. i. 631; Brand. For. Fl. 96.—A large climbing shrub, remaining low and shrubby in dry situations, all younger parts pubescent or tomentose, the stems as thick as the arm; bark 1-2 lin. thick, reddish and olive-green, net-veined, slightly fissured; cut greenish; leaves ovate-oblong or oblong, shorter or longer petioled, about 3-4 in. long, shortly acuminate, crenate-serrate, tomentose while young, more or less glabrescent on both sides; flowers greenish, tomentose, minute, on 1-2 lin. long rather thick pedicels, densely clustered, in shorter or longer racemes forming terminal greyish or more usually pale tawny tomentose leafless panicles; calyx about 2 lin. in diameter; petals cuneate, crenulate at the blunt apex; nuts globular, the size

of a pea, to about its middle surrounded by the adnate calyx and there marked by a prominent ring (indicating the remains of the calyx-limb), shortly yellowish puberulous, at the top prolonged in a flat, linear-oblong, coriaceous, blunt or almost retuse wing of about 1-1½ in. in length.

Hab.—Not unfrequent in the open, especially the Eng forests, and in the dry forests of Prome, Pegu, and Martaban; also in Ava.—Fl. Nov.; Fr. March-Apr.—l. or s: l.—SS.=petrophilous *imperm.*

Remarks.—Wood coarse, fibrous, yellowish or brownish yellow, rather heavy, perishable.

3. **V. leiocarpa,** Bth.; H.f. Ind. Fl. i. 631.—A scandent shrub, all parts glabrous; leaves ovate-oblong or ovate-lanceolate, on a short and rather thick petiole, 3-3½ in. long, shortly and bluntish acuminate, crenate-toothed, glabrous; flowers small, glabrous, on 1-2 lin. long quite glabrous pedicels, clustered and forming leafy, more or less puberulous or almost glabrous simple racemes in the axils of the leaves and at the end of the branchlets; calyx nearly 2 lin. in diameter, glabrous; nuts globular, the size of a small pea, quite glabrous, to the middle surrounded by the adnate calyx, and forming there a raised ring, at the apex produced in an oblong-lanceolate almost chartaceous glossy blunt wing of about 2 in. in length.

Hab.—Tenasserim.

4. **V. Maingayi,** Laws. in H.f. Ind. Fl. i. 631.—An evergreen climbing shrub, all parts glabrous; leaves oblong-lanceolate to oblong, blunt or almost notched, 4-7 in. long, shortly petioled, entire, coriaceous, glabrous, with about 10 lateral nerves on each side; flowers in long, filiform, simple or compound racemes; fruits glabrous and almost polished; the nut globular, nearly ½ in. in diameter, blackish, the calyx forming a large basal adnate disk, the wing 2-2½ in. long, oblong-lanceolate, shortly acuminate.

Hab.—Tenasserim.

APTERON, Kz.

Calyx 5-cleft, with a short obversely conical tube. Petals 5, minute, inserted between the calyx-lobes. Stamens 5, the filaments filiform. Disk flat, free. Ovary immersed in the disk, 2-celled; style very short with 2 short stigmas. Nut globular, quite enclosed in, and adnate to, the enlarged calyx, crowned by the annular calyx-limb, not winged, 1-celled and 1-seeded.—Scandent shrubs, with alternate penninerved leaves. Flowers small, clustered, forming racemose panicles.

1. **A. lanceolatum,** Kz.; H.f. Ind. Fl. i. 643.—A large scan-

dent shrub, the young shoots puberulous; leaves lanceolate, on a thick, puberulous and glabrescent petiole 2-3 lin. long, long and bluntish acuminate, serrate, chartaceous, 4-5 in. long, tawny puberulous on the nerves, soon glabrous; flowers small, on a line long puberulous pedicels, clustered or almost solitary, in racemes forming terminal and axillary greyish or yellowish pubescent panicles; calyx densely or slightly puberulous, about 1½-2 lin. in diameter; ovary pubescent; nuts (drupaceous (?), globular, unripe the size of a pepper-kernel, enclosed in the glabrescent enlarged calyx to nearly to the apex, and there surrounded by the remains of the calyx-limb.

Hab.—In the tropical forests of the eastern slopes of the Pegu Yomah (Yainoay chg.) and Upper Tenasserim.—Fl. Febr.; Fr. March-Apr.

SMYTHEA, Seem.

Calyx 5-lobed, the tube obversely conical. Petals 5, hood-shaped. Stamens 5, free; anthers didymous. Disk 5-angular, rather flat. Ovary half-inferior, 2-celled; styles 2, recurved. Capsule compressed, but wingless, at the very base supported by the calyx, dehiscing along the middle into 2 valves, 1-celled and 1-seeded. Albumen none.—Scandent shrubs, with alternate penninerved leaves. Flowers small, clustered, racemose, forming panicles.

1. **S. calpicarpa,** Kz.; H.f. Ind. Fl. i. 632.—A scandent evergreen shrub, the branchlets tawny pilose; leaves lanceolate, on a thick, more or less pilose petiole ½-1 lin. long, acuminate, serrate, chartaceous, 4-3½ in. long, pilose along the midrib beneath, the rest glabrous; capsules (unripe) 1¼ in. long, oblong, obliquely truncate at the top, densely tawny puberulous, coriaceous.

Hab.—Tenasserim (or Andamans?).

BERCHEMIA, Neck.

Calyx 5-cleft, the tube hemispherical or turbinate. Petals 5, hooded. Stamens 5, the filaments filiform. Disk filling the calyx-tube, the margins free. Ovary immersed in the disk, free, 2-celled, narrowed in a 2-cleft style. Drupe more or less oblong, at base supported by the small calyx-tube, containing a crustaceous or woody 2-celled putamen. Albumen fleshy.—Erect or more usually scandent shrubs, with alternate penninerved leaves usually glaucous beneath. Flowers small, solitary or clustered, in racemose, terminal and axillary panicles.

1. **B. floribunda,** Brongn.; H.f. Ind. Fl. i. 637; Brand. For. Fl. 91.—A large scandent shrub, all parts glabrous; leaves elliptically to oblong-ovate, on a slender ½-1 in. long petiole, rounded at the base, 1½-3 in. long, shortly and abruptly acuminate, chartaceous,

entire, glabrous, glaucescent beneath, the lateral nerves numerous and parallel; flowers small, on a lin. long slender pedicels, clustered racemose, forming glabrous panicles in the axils of the upper leaves and at the end of the branchlets; calyx glabrous, about 2 lin. across; drupes ovoid-oblong, slightly compressed, about ½ in. long or somewhat longer, bluish-black, smooth or pruinous, containing a woody 2-celled putamen.

HAB.—Ava, Khakyen hills.—Fl. Aug.

ZIZYPHUS, Juss.

Calyx 5-lobed, the tube broadly obversely conical. Petals 5 (rarely none), hooded. Stamens 5, the filaments subulate. Disk flat, filling the short calyx-tube, the borders free. Ovary immersed in the disk and at the base confluent with it, 2- (very rarely 3- or 4-) celled, with as many free styles or style-branches. Drupe fleshy, containing a woody or bony 1-3-celled and 1-3-seeded stone. Albumen none or scanty.—Trees or shrubs, sometimes climbing, armed with stipular sharp prickles. Leaves alternate, often oblique, palmately 3- or 5-nerved. Flowers small, in axillary cymes, sometimes panicled.

× Leaves beneath more or less pubescent or tomentose.
  ○ Cymes long-peduncled, forming large terminal and lateral tomentose panicles; leaves large, densely tawny tomentose beneath . . . . . *Z. rugosa.*
  ○ ○ Flowers in axillary short cymes or clusters.
Climber or straggling shrub; leaves usually acuminate; drupes the size of a small pea or pepper-kernel; putamen usually 1-celled . . . . . *Z. œnoplia.*
Tree or erect shrub; leaves usually blunt; drupes the size of a cherry; putamen 2-celled . . . . . *Z. jujuba.*
× × Leaves quite glabrous or nearly so; drupes while young tomentose or pubescent . . . . . *Z. glabra.*

1. **Z. rugosa,** Lamk.; H.f. Ind. Fl. i. 636; Bedd. Sylv. Madr. 68; Brand. For. Fl. 89.—*Myouk-zee.*—A tree (20—30 + 8—18 + 1½—3), armed with recurved, short, but strong stipular prickles (usually solitary by abortion), shedding leaves in H.S., all younger parts densely tawny tomentose; leaves ovate or ovate-oblong, rounded or obtuse at the more or less oblique 3-or 5-nerved base, on a 3-6 lin. long, thick, tomentose petiole, 5-6 in. long, acute, serrulate, almost coriaceous, densely tawny villous beneath; flowers small, tomentose, greenish, on 2-3 lin. long tomentose pedicels, forming long-peduncled cymes arranged into tomentose ample panicles at the end of the leafless branchlets; calyx tomentose, 2½ lin. in diameter; ovary and young fruit fugaceously pubescent; drupes the size of a small cherry, obversely turbinate or pear-shaped, yellowish, with a thin smooth epicarp surrounding the woody usually 1-seeded stone.

Hab.—Frequent all over Burma from Ava and Martaban down to Tenasserim, in all leaf-shedding forests, more especially in the open forests, but rare in the alluvium.—Fl. March-Apr.; Fr. May.—l.—SS.=∞.

2. **Z. jujuba,** Lamk.; H.f. Ind. Fl. i. 632; Bedd. Sylv. Madr. t. 149; Brand. For. Fl. 86, t. 17.—*Zee-pen.*—A leaf-shedding or an evergreen tree (25—30+10—15+2—3), remaining often stunted or shrubby, armed with thin, short, usually paired stipular prickles (one of the pair curved, the opposite one short and straight), rarely almost unarmed, all younger parts whitish or tawny tomentose; bark ⅓ in. thick, dark-brown, longitudinally furrowed and fissured and horizontally cracked, brittle, fibrous; cut reddish; leaves from oblong and ovate to almost rotundate, slightly or not unequal at the 3-nerved base, on a 3-6 lin. long densely tomentose petiole, blunt, serrulate, 1-2-3 in. long, almost coriaceous, above glabrous with the exception of the principal nerves, densely greyish or tawny tomentose beneath; flowers small, greenish, on rather long shortly tomentose pedicels, forming small, lax or dense, almost sessile, greyish-tomentose cymes in the axils of the leaves; calyx about 2 lin. in diameter, tomentose; ovary glabrous, 2-celled; styles 2, united to the middle; drupes globose or oblong, the size of a cherry or much smaller, yellow or orange-yellow, edible, containing a wrinkled, woody, usually 2- rarely by abortion 1-celled stone.

Hab.—In leaf-shedding forests, especially in the dry and savannah forests, common in Prome and Ava, less so over the other provinces; also frequently cultivated in and around villages.—Fl. Aug.-Sept.; Fr. Octob.-Jan.—l.—SS.=∞ *CaS.*

Remarks.—Sap-wood yellowish, heart-wood dark-brown, fine and close-grained, strong and hard. Good for cabinet-work. Gives good charcoal. Bark good for tanning. Lac is found on it.

3. **Z. œnoplia,** Mill.; H.f. Ind. Fl. i. 634; Bedd. Sylv. Madr. 69; Brand. For. Fl. 86.—*Taw-zee-nway.*—A large often lofty scandent shrub, remaining shrubby and erect in barren situations, armed with sharp but short solitary or paired stipular prickles (one of them straight, the other curved), all softer parts more or less densely appressed pubescent or villous; leaves ovate-lanceolate or ovate, usually very oblique, 3- rarely 5-nerved at the base, acute or acuminate, rarely blunt, on a short but slender tomentose petiole, 1½-2½ in. long, crenulate-serrate or almost entire, membranous, appressed pubescent on both surfaces, more so beneath, and here often almost villous; flowers small, greenish yellow, on 1-1½ lin. long slender pedicels, forming small, poor or crowded, almost sessile or shortly peduncled cymes in the axils of the leaves; calyx about a line in diameter, puberulous or pubescent; the sepals ovate, acuminate; petals obovate, narrowed at base, embracing the filament; disk 10-crenate; ovary glabrous, 2-celled; drupes elliptical or

almost globular, the size of a small pea or pepper-kernel, black, smooth, edible, containing a 2- or by abortion often 1-celled thin wrinkled nut.

HAB.—Very frequent in all forests, evergreen as well as leaf-shedding, also in savannahs, shrubberies, &c., all over Burma and adjacent provinces down to the Andamans.—Fl. Sept.-Octob. ; Fr. C. S.—s : l. and l.—SS. = ∞.

4. **Z. glabra,** Roxb.—A lofty glabrous scandent shrub, armed with short but sharp-curved usually solitary prickles, the young shoots slightly and shortly puberulous ; leaves ovate to ovate-oblong, rarely ovate-lanceolate, not or slightly oblique, 3-nerved, on a very slender 3-4 lin. long glabrous or puberulous petiole, shortly bluntish acuminate, serrulate, chartaceous, quite glabrous, elegantly transversely veined ; flowers small, on slender about 2 lin. long puberulous pedicels, forming short-peduncled puberulous cymes in the axils of the leaves and about twice so long as the petioles ; calyx shortly pubescent, about 2 lin. in diameter ; ovary pubescent ; drupes globular or nearly so, the size of a large pea, while young densely pubescent, afterwards tawny-velvety or almost glabrescent, yellow, sappy, containing a smooth, thin, bony stone usually 1-celled by abortion.

HAB.—Frequent in the tropical forests from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. Febr.-March ; Fr. Apr.—s : l.– SS. = petrophilous.

SAGERETIA, Brongn.

Flowers hermaphrodite. Calyx 5-cleft, the tube hemispherical or urceolate. Petals 5, hooded. Stamens 5. Disk cup-shaped, with a free 5-lobed margin, filling the calyx-tube. Ovary immersed in the disk, free, 3-celled ; style short, with 3 stigmas. Drupe containing 3 indehiscent coriaceous pyrenes. Albumen thin. —Unarmed or spinose shrubs, with opposite or almost opposite penninerved leaves. Stipules minute, deciduous. Flowers small, in axillary spikes or clusters, or panicled.

1. **S. theezans,** Brongn. ; H.f. Ind. Fl. i. 641 ; Brand. For. Fl. 95.—An unarmed or slightly armed shrub, the young shoots slightly tawny pubescent ; leaves elliptical to oval-oblong, rounded or obtuse at the base, on a slender puberulous petiole 2-3 lin. long, blunt or rounded at apex, ½-1½ in. long, entire, membranous, while young slightly hirsute along the midrib beneath, soon quite glabrous, pale beneath ; flowers small, sessile, in short small axillary spikes ; calyx minute ; petals glabrous, ½ lin. long.

HAB.—Ava.—Fl. Octob.

SCUTIA, Comm.

Flowers hermaphrodite. Calyx 5-cleft, the tube hemispherical or turbinate. Petals 5, flat or hooded. Disk filling the calyx-tube, the margins free and waved. Stamens 5. Ovary immersed in the disk, free, 2-4-celled; style short, 2-3-cleft. Drupes dry or fleshy, containing 2-4 crustaceous pyrenes. Albumen none or scanty.—Spiny or unarmed shrubs, with opposite or almost opposite penninerved leaves. Flowers axillary, in clusters or small umbellets.

1. **S. Indica,** Brongn.; H.f. Ind. Fl. i. 640.—A wild straggling shrub, armed with opposite sharp curved spines, all parts glabrous; leaves almost alternate, obovate to oblong, on a short slender petiole, acute at the base, 1-2 in. long, retuse, blunt or acute, thinly coriaceous, entire or serrulate upwards, glabrous, shining above; flowers yellowish-green, small, on slender a line long pedicels, forming a few-flowered very small glabrous umbellet in the axils of the leaves; berries depressed globular, the size of a pea, smooth.

Hab.—Upper Tenasserim, along the Attaran.

COLUBRINA, L. C. Rich.

Calyx 5-cleft, the tube hemispherical. Petals 5, hooded. Stamens 5. Disk thick, annular, 5-10-lobed or 5-cornered, filling the calyx-tube. Ovary immersed in the disk and confluent with the same, 3-celled, the style short, 3-cleft or 3-parted. Drupe obsoletely 3-lobed, up to near $\frac{1}{3}$ surrounded by the calyx-tube, containing 3 cocci often capsule-like separating and loculicidally dehiscing. Albumen fleshy, but thin.—Scandent or erect shrubs, with alternate penninerved leaves 3-nerved at base. Stipules small, deciduous. Flowers small, in axillary cymes or clusters.

Leaves and cymes glabrous . . . . . *C. Asiatica.*
Cymes and leaves (at least beneath) tawny pubescent . . . *C. pubescens.*

1. **C. Asiatica,** Brongn.; H.f. Ind. Fl. i. 642; Bedd. Sylv. Madr. 69, t. 10, f. 5.—*Kuay-nway.*—A large unarmed spreading shrub, often scandent, all parts glabrous; leaves ovate or ovate-lanceolate, on a slender, more or less puberulous petiole 6-10 lin. long, acuminate, $2\frac{1}{2}$-4 in. long, crenate-serrate, membranous, glabrous; flowers small, pale-greenish, on 3-4 lin. long slender pedicels, forming short, almost sessile or shortly peduncled, glabrous cymes in the axils of the leaves; calyx about $1\frac{1}{2}$ lin. in diameter; drupes 3-lobed-globose, the size of a large pea, pale-brown, supported by the circularly-truncate calyx-tube, 3-coccous.

Hab.—Frequent in the beach- and coast-forests along the sea-shores from Arracan down to Tenasserim and the Andamans.—Fl. Febr ; Fr. March-Apr.—l.—SS.= Aren. All.

2. **C. pubescens,** Kz. ; H.f. Ind. Fl. i. 642.—A large leaf-shedding scandent shrub, unarmed, all younger parts densely tawny pubescent ; leaves as in preceding, but densely tawny pubescent while young, glabrescent above ; flowers small, greenish, on slender, a line long, pubescent pedicels, forming short, thick, tawny pubescent cymes in the axils of the leaves ; drupes smaller than those of the preceding species.

Hab.—Frequent in the open, especially the low forests (and entering also the tropical forests) all over Pegu and Martaban.—Fl. March ; Fr. Apr.-May.—s : l.—SS.= petrophilous, *Arg.*

GOUANIA, L.

Flowers polygamous. Calyx 5-lobed, the tube short, obversely conical, adhering to the ovary. Petals 5, hooded. Stamens 5. Disk filling the calyx-tube, 5-angular or produced into 5 horns. Ovary immersed in the disk, 3-celled ; style 3-parted or 3-cleft. Fruits coriaceous, inferior, crowned with the persistent calyx-limb, 3-winged, containing 3 almost woody indehiscent cocci separating from the 6-parted axis. Albumen scanty.—Shrubs, usually scandent, bearing tendrils, with alternate penninerved leaves often 3-nerved at the base. Stipules oblong, deciduous. Flowers small, in axillary or terminal racemes or spikes, the rachis often transformed into a tendril.

Leaves, etc., glabrous or nearly so, the former crenate-serrate ; disk glabrous, 5-horned ; capsules glabrous, c. 5 lin. long . . . *G. leptostachya.*
All softer parts rusty-tomentose ; leaves entire ; capsules 3-4 lin. long, puberulous, glabrescent . . . . . *G. Brandisii.*

1. **G. leptostachya,** DC. ; H.f. Ind. Fl. i. 643.—*Ta-yaw-nyo-nway.*—A large scandent tendril-bearing shrub, the young shoots slightly pubescent, the stems about 2 in. thick ; bark grey, spongy, tortuously fissured ; leaves ovate- or oblong-cordate, on a long and slender petiole, about 3-4 in. long, acuminate, coarsely crenate-serrate, glabrous or sparingly sprinkled with short appressed hairs along the nerves beneath ; flowers small, yellowish, on short sparingly pubescent pedicels, forming slender, elongate, puberulous, soon quite glabrescent racemes in the axils of the leaves and at the end of the branchlets ; disk glabrous, cup-shaped, expanded into 5 short spreading notched horns ; drupes capsular, coriaceous, with 3 rounded short wings, glabrous, 3-valved, containing 3 shining seeds.

Hab.—Frequent in the mixed forests and in shrubberies around villages and along streams all over Burma down to Tenasserim.—l.—Fl. close of R.S. ; Fr. C.S.—SS.= ∞.

2. **G. Brandisii**, Hassk.—A large woody tendril-bearing climber, all softer parts densely rusty-tomentose or villous; leaves cordate-ovate, on a more or less tomentose 3 lin. to nearly an inch long petiole, $2\frac{1}{2}$-$3\frac{1}{2}$ in. long, acute or acuminate, quite entire, shortly pubescent above, densely tawny (on the nerves rusty) pubescent beneath; racemes axillary and terminal, rusty or tawny tomentose, often panicled at the end of the branches; flowers...; drupes capsular, 3-4 lin. long, with 3 rounded glabrous wings, minutely puberulous, 3-1 valved, containing 3 glossy seeds.

Hab.—Not unfrequent in the tropical forests of Martaban and Tenasserim.—Fr. Febr.-March.—s : l.—SS. = Metam.

AMPELIDEÆ.

Flowers regular, hermaphrodite or unisexual. Calyx entire or 4-5-toothed. Petals 4 or 5, free or cohering, valvate. Stamens 4 or 5, opposite to the petals, inserted outside of the disk. Disk free or adnate to the ovary. Ovary more or less perfectly 2-6-celled, with 1 or 2 erect ovules in each cell. Fruit a berry, the dissepiments frequently disappearing. Seeds 1-6. Albumen ruminate.—Woody or herbaceous climbers or rarely erect shrubs or small trees, the branches often jointed. Leaves alternate or opposite, simple or compound, the petiole expanded in a membranous stipule. Flowers small, in leaf-opposed or axillary inflorescences, never solitary or clustered.

Ampelideæ are very nearly allied to *Rhamneæ*, but easily recognised by the more developed petals, the berry-like fruits, and general habit. The grape is too well known to need further remarks, but the rest of vines are of little or no importance to the forester. Many of these climb the loftiest trees with their tow-shaped stems and form part of the so-called lianes of tropical forests. I have given all the species in the following analytical keys, but describe only such of them as are woody to a certain degree.

Stamens free; tendril-bearing climbers . . . . . *Vitis.*
Petals and stamens united with the disk; erect shrubs or trees. *Leea.*

VITIS, L.

Calyx entire or lobed. Petals 4 or 5, free or cohering with their tips. Disk various or obsolete. Stamens 4 or 5, free. Ovary 2 (rarely 3-4) -celled with 2 ovules in each cell. Berry 1-2-celled.—Tendril-bearing climbers, rarely herbaceous, with simple or compound leaves. Flowers small, in axillary or leaf-opposed inflorescences.

* *Flowers in leaf-opposed or axillary cymes.*
× *Style or stigma 4-lobed or 4-parted.*
\+ Stigma sessile, 4-lobed or 4-parted. Flowers sometimes unisexual, Cymes axillary, rarely leaf-opposed. Leaves compound.

All parts glabrous (or the petioles and cymes often puberulous); leaves pedate or the upper ones often 3-foliolate, sappy-coriaceous; berries the size of a cherry, white; stem usually tubercled . . . . . *V. lanceolaria.*

All parts and the very short cymes glabrous; leaves 3-foliolate, sappy-herbaceous; pedicles short, cymulose; berries pea-shaped, white . . . . . *V. angustifolia.*

All parts glabrous; leaves pedate, herbaceous; pedicels 2-3 lin. long, umbellate; berries blackish . . . . . *V. capreolata.*

Young shoots and petioles rusty-hirsute; leaves digitate; rest as above . . . . . *V. obtecta.*

\+ + Style short, 4-lobed at apex, the lobes spreading. Flowers unisexual or hermaphrodite.

Hermaphrodite; leaves coriaceous, 3-foliolate . . . . *V. assimilis.*

Flowers unisexual; leaves membranous, 3-foliolate . . . *V. oxyphylla.*

× × *Style and stigma simple.*
‡ Leaves variously compound.
\+ Leaves pedate.
† Cymes axillary, long-peduncled.

All parts pubescent or almost glabrous; leaflets finely acuminate *V. pedata.*

Leaflets cuneate-obovate, rather blunt or acute, slightly pubescent along the nerves beneath. . . . . *V. tenuifolia.*

†† Cymes leaf-opposed and spuriously axillary, *i. e.*, the cyme at the end of an axillary leaved or leafless shoot.

All parts glabrous; leaves along the nerves beneath sparingly pubescent . . . . . *V. Japonica.*

All parts densely puberulous or pubescent . . . . . *V. Teysmanni.*

\+ + Leaves all 3-foliolate.

All parts shortly puberulous; cymes axillary or on axillary shoots, puberulous . . . . . *V. trifolia.*

All parts glabrous, the cymes leaf-opposed, glabrous; leaves glaucous beneath . . . . . *V. Himalayana.*

\+ + + Leaves digitate.

All parts puberulous; cymes axillary or terminal on axillary shoots; leaflets 1½-2 in. long . . . . . *V. auriculata.*

Leaves glabrous; leaflets 4-6 in. long, herbaceous; cymes puberulous; berries globular . . . . . *V. erythroclada.*

Leaves glabrous; leaflets 4-6 in. long, coriaceous; cymes puberulous, very slender; berries coffee-bean-shaped and somewhat curved . . . . . *V. campylocarpa.*

‡ ‡ Leaves simple. Cymes leaf-opposed.
† Branches and branchlets cornered, sometimes almost winged and fleshy.

Branchlets very fleshy, 4-cornered, jointed; leaves small, fleshy, bluntish crenate; cymes simple . . . *V. quadrangularis.*

Branchlets sharply 6-cornered; leaves bristly serrate, herbaceous; cymes compound, peduncled or sessile . . *V. discolor.*

Branchlets bluntish 5-angular, thick and glossy; leaves remotely bristly toothed, long-petioled . . . . *V. pentagona.*

†† Branches and branchlets terete or nearly so; berries often nodding.

Branchlets terete, whitish pruinous; all parts glabrous . . *V. repens.*

All parts, especially while young, rusty or tawny tomentose or pubescent, more or less glabrescent; leaves sharply acuminate, never lobed . . . *V. adnata.*
All younger parts rusty-tomentose or pubescent, glabrescent; leaves large, often somewhat 3-lobed, bluntish acuminate . . . . . *V. Linnæi.*
As former, but cymes axillary . . . . . *V. Wallichii.*

* * *Flowers 4- or 5-merous, in cymose panicles, racemes, spikes, or more usually the one or both tendril-branches transformed in a panicle.*

× Flowers pedicelled.

Branchlets, peduncles, and usually the petioles covered with a woolly tomentum intermixed with black, spreading, stiff hairs . . . . . *V. barbata.*
Branchlets glabrous; cymose panicles ample, glabrous, with or without tendrils; pedicels thick, nearly a line long; leaves 3-5-lobed, the lobes usually acute . *V. latifolia.*
Branchlets, etc., woolly; leaves lobed or palmately lobed; panicles usually tendril-bearing, short and rather compact; pedicels very short and thick . . *V. tomentosa.*
Branchlets, etc., woolly; leaves tawny woolly beneath, not or slightly lobed; panicles usually tendril-bearing, woolly, large and lax; pedicels 1½ lin. long, very slender *V. lanata.*

× × Flowers sessile, in panicled spikes.

Leaves pedately 5-foliolate; spikes panicled, like the branchlets, etc., rusty-tomentose . . . . . *V. Helferi.*
All parts quite glabrous; leaves coriaceous, digitate; flowers spicate, forming very long, glabrous panicles . *V. polystachya.*

* *Flowers in leaf-opposed or axillary cymes.*

× *Style or stigma 4-lobed or 4-parted.*

1. **V. lanceolaria,** Wall.; H.f. Ind Fl. i. 660; Brand. For. Fl. 101.—*Kyee-nee-nway* or *kyee-chee-nway.*—A large woody evergreen climber, the stems and often also the branchlets and petioles corky-tubercled, all parts glabrous, rarely the shoots puberulous; tendrils simple, glabrous; leaves pedately 5-foliolate, those of the shoots occasionally 3-foliolate, glabrous, on a 3-4 in. long glabrous or puberulous petiole; leaflets lanceolate or oblong-lanceolate, on a 3-4 lin. long, thick, glabrous or puberulous petiolule, the lateral ones more or less oblique and unequal, 4-6 in. long, acute at the base longer or shorter bluntish acuminate, remotely serrate-toothed, almost fleshy, fleshy coriaceous and glossy while fresh; cymes short or ample, axillary or rarely almost leaf-opposed, bracted, puberulous, branched; flowers dioecious, small, greenish white, on shorter or longer puberulous pedicels; flower-buds 4-horned; calyx almost entire, very short; petals 4, puberulous outside; stamens 4, the filaments filiform; stigma short, sessile or nearly so, 4-lobed; berries globose or depressed globose, the size of a cherry, glossy, of a watery flesh-colour or white, containing 1-4 seeds nearly 4 lin. long.

Hab.—Common in the tropical forests all over Martaban and Tenasserim down to the Andamans; also along the eastern slopes of the Pegu Yomah.—Fl. Febr.-March; Fr. Apr.-May.—s: l.—SS.=petrophilous.

2. **V. assimilis,** Kz.—A glabrous woody climber with terete tubercled branches; leaves constantly 3-foliolate, on a 1-1½ in. long petiole; leaflets on very short thick petiolules up to a lin. long, oblong-lanceolate (the lateral ones oblique and rounded at the one side of the unequal base), 3-4 in. long, acute, crenate-toothed, coriaceous, glabrous; flowers small, greenish-white, hermaphrodite, on a line long, thick, densely tawny puberulous pedicels, forming short-peduncled usually nodding much-branched puberulous cymes in the axils of the leaves; petals 4; ovary narrowed in a short thick style terminated by 4 short spreading lobes.

Hab.—Not unfrequent in the drier hill forests of the Martaban hills east of Tounghoo, at 3,500 to 4,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

×× *Style and stigma simple.*

3. **V. pedata,** Wall.; H.f. Ind. Fl. i. 661.—A woody climber bearing leaf-opposed, simple or 2-cleft tendrils, all parts glabrous or softly pubescent; leaves pedately 5- rarely 7-11-foliolate, on a 2-3 in. long petiole; leaflets oblong-lanceolate or ovate-oblong, the lateral ones usually more or less oblique and unequal, about 4-6 in. long, shortly but sharply acuminate, bluntish and remotely serrate-toothed, membranous, beneath or on both surfaces more or less pubescent or quite glabrous; stipules cordate, acute, caducous; flowers small, greenish-white, on 1-2 lin. long slender puberulous or glabrous pedicels, forming axillary long-peduncled glabrous or densely pubescent corymbose cymes of about the length of the petiole; calyx conspicuous, truncate; petals 4, about 1½ lin. long; disk large, 4-lobed; stamens 4; the filaments slender; style simple, filiform; berries depressed-globose, about the size of a large pea, obscurely 4-lobed, smooth, white, 4-seeded.

Hab.—Frequent in the mixed forests, in hedges and amongst shrubberies, all over Burma down to Tenasserim and the Andamans.—Fl. Begin. of R.S.—l×s.—SS.=∞.

4. **V. Himalayana,** Brand. For. Fl. 100; H.f. Ind. Fl. i. 655.—A glabrous woody climber with terete lenticellate branchlets; leaves 3-foliolate, the petiole up to 6 in. long; leaflets as long as the petiole, unequal at the base, obliquely ovate-oblong (the terminal one almost oblong), on 3-4 lin. long petiolules, caudate-acuminate, coarsely crenate-toothed, membranous, glabrous, glossy above, beneath glaucous and net-veined; flowers small, greenish-white, on short thick pedicels, forming glabrous peduncled dichotomously branched cymes arising opposite the young leaves on the annual shoots or shooting out from the older branches; calyx truncately 4-lobed, short; petals 5, oblong, hooded, acute; ovary ovate with a very short simple style thickened at the apex; berries the size of a small pea, smooth, 1-2-seeded.

Hab.—Not unfrequent in the drier hill forests of the Martaban hills, east of Tounghoo, at 3,000 to 5,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

5. **V. auriculata,** Wall.; H.f. Ind. Fl. i. 658.—*Yin-noung-peing-nway.*—A large woody tendril-bearing climber, all parts pubescent, the stem about 1½ ft. in girth, terete; bark spongy and deeply cracked; tendrils 2-3-cleft; leaves digitately 5- rarely 3-foliolate, on a 2-3 in. long petiole, densely pubescent; leaflets obovate-oblong, more or less rhomboid, rather shortly petioluled, about 2-3 in. long, narrowed at the base, acute or acuminate, coarsely serrate-toothed, above minutely puberulous or smooth and shining, beneath shortly pubescent; stipules rather large, ear-shaped, falcate-oblong, blunt; flowers small, on 1-1½ lin. long strong puberulous pedicels, cymulose, forming a long-peduncled densely puberulous corymbose cyme at the end of the young axillary shoots; calyx short, truncate, puberulous; petals and stamens 4; style simple, subulate; berries almost globular, the size of a small cherry, smooth, red, containing a single obliquely obovate somewhat compressed seed.

Hab.—Not unfrequent in the tropical and moister upper mixed forests of the Pegu Yomah.—Fl. Begin. of R.S.—s: l.—SS.=SiS.

Remarks.—Wood reddish, very coarsely fibrous.

6. **V. erythroclada,** Kz.—*Woon-oo-nway* or *myae-zoo-nway.*—A large leaf-shedding woody climber, the younger parts slightly pubescent, the branchlets reddish brown, terete; stem terete, as thick as the arm; bark ½-¾ in. thick, brown, coarsely longitudinally cracked; cut brown; tendrils 2-cleft; leaves digitately 5-foliolate, on a 4-5 in. long glabrous petiole; leaflets broadly obovate-oblong, on slender 1-2 in. long glabrous petiolules, acute at the base, 4-6 in. long, shortly acuminate, serrate, membranous, while young slightly pubescent along the nerves beneath, soon turning quite glabrous; flowers small, yellowish-green, on 1½-3 lin. long puberulous pedicels, cymulose, forming rather short dichotomous puberulous and more or less glabrescent lax cymes; calyx short, puberulous; petals and stamens 4; style simple, subulate; berries globular, the size of a cherry.

Hab.—Not unfrequent in the tropical forests, especially along choungs of the eastern slopes of the Pegu Yomah and Martaban.—Fl. March; Fr. May.—s: l.—SS.=SiS., Metam.

Remarks.—Wood light-brown, fibrous, coarse.

7. **V. campylocarpa,** Kz.; H.f. Ind. Fl. i. 657.—A lofty woody climber with terete stems and strong leaf-opposed tendrils, all parts quite glabrous; leaves digitately 5 (to 7?) -foliolate, on 2-3 in. long smooth petioles; leaflets jointedly inserted on a ½-1½ in. long petiolule, obovate, tapering towards the acute base, the lateral ones

somewhat unequal, 4-6 in. long, abruptly acuminate, remotely and slightly crenate-toothed, succulent-coriaceous, glabrous; cymes axillary, dichotomously branched, very shortly peduncled or almost sessile, glabrous; berries the size and somewhat the shape of a coffee-bean, slightly curved, smooth and glossy, on a line long peduncle, containing a single coffee-bean-shaped sulcate transversely striate seed.

Hab.—In the tropical forests of the north-eastern slopes of Kambala toung, Pegu Yomah, at 1,000 ft. elevation.—Fr. March.

8. **V. pentagona,** Voigt.; H.f. Ind. Fl. i. 646.—A large glabrous climber, with thick succulent 5-angular glossy branches; leaves ovate or ovate-oblong, almost truncate or slightly sinuate at the base, acuminate, 3-5 in. long, on a 1-1½ in. long petiole, remotely bristly toothed, succulent-herbaceous, quite glabrous and shining; flowers small, yellowish, on thick pedicels a line or a little longer, forming simple or slightly compound glabrous leaf-opposed cymes; calyx truncate; petals 4, oblong-lanceolate, hooded, acuminate, nearly a line long; stamens 4; style short, simple; berries globular, the size of a small cherry, glossy black, containing usually 2 smooth compressed-convex orbicular-ovate seeds.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and Arracan; also in Chittagong and the Andamans.—Fl. Octob.; Fr. Apr.-May.—s : l.—SS. = SiS.—Chloritic rocks.

9. **V. repens,** W.A.; H.f. Ind. Fl. i. 646.—A large climber, the branches and branchlets terete or nearly so, more or less pruinous, the latter often white-mealy; tendrils leaf-opposed, 2-cleft; leaves simple, cordate or broadly cordate, rarely ovate-oblong, on long petioles, the larger lower ones usually angular, about 1½ to 3 in. long, acuminate, or occasionally almost blunt, bristly serrulate, membranous, glaucous green, glabrous; stipules oblong or oboval, blunt, green; flowers small, yellowish or reddish outside, on 2-3 lin. long slender pedicels, almost umbellate, forming a leaf-opposed umbellately branched longer or shorter peduncled glabrous cyme usually of the length of the leaves or shorter; calyx glabrous, short, obsoletely 4-lobed; petals and stamens 4; disk 4-lobed, yellow; style simple, rather robust; berries globular, the size of a pea, turning purplish-black, smooth and glossy, usually 1-seeded.

Hab.—Frequent in the tropical and in the moister mixed forests all over Burma, from Ava and Chittagong down to Tenasserim and the Andamans.—Fl. R. S; Fr. C.S.—s : l.—SS. = ∞.

10. **V. Linnæi,** Kz. (*V. repanda,* W.A.; H.f. Ind. Fl. i. 648). —*Yin-noung-nway.*—A large leaf-shedding climber, bearing simple or many-cleft tendrils on the young shoots, all younger parts covered with a fugaceous tawny or rusty-coloured wool or tomen-

tum; stem somewhat compressed, corky, uneven, deeply and longitudinally cracked; leaves simple, on very long slender petioles, broadly cordate and usually somewhat angular or obsoletely lobed, about 5-6 in. long and nearly as broad, shortly and bluntish acuminate, remotely and bristly repand-serrulate, 5-nerved at the base, membranous, sparingly woolly (especially beneath), when full grown chartaceous and quite glabrous; stipules oblong, small; flowers small, reddish, drooping on long, slender, woolly glabrescent pedicels arising umbellately from rusty villous knobs and forming a leaf-opposed, sparingly woolly, glabrescent, divaricate, long-peduncled (2-2½ in.) cyme; calyx short, usually villous; petals and stamens 4; style simple, rather thick; berries all drooping, obovate, about the size of a small pea, purplish-black, smooth, 1-2-seeded.

Hab.—Frequent in the mixed forests as also in shrubberies and grass jungles all over Burma and adjacent provinces down to the Andamans.—Fl. Apr.-May; Fr. R.S.—s: l.—SS.=∞.

** *Flowers in cymose panicles, racemes, spikes, or more usually one or both tendril-branches transformed into a panicle.*

11. **V. barbata,** Wall.; H.f. Ind. Fl. i. 651.—A large woody climber, all parts, except the leaves, covered with copious, long, capitate, brown or blackish, stiff hairs; petioles long, covered with a woolly tomentum intermixed with long, spreading, blackish, stiff hairs; leaves simple, broadly or rounded-cordate, 5-6 in. long by 6-7 broad, strongly 5-nerved at the base, irregularly sinuate-toothed, not or obsoletely 3-lobed, while young covered with a loose very fugaceous tomentum, soon turning glabrous above and slightly woolly along the prominent nerves beneath, membranous; tendrils leaf-opposed, woolly, and beset with long stiff hairs, 2-3-cleft, the one branch transformed in a tomentose more or less elongate panicle, consisting of small racemulose flowers on very short, thick, tomentose pedicels; calyx short, obsoletely 4-lobed; petals and stamens 4 or 5 each, the former about a line long, glabrous; stigma sessile.

Hab.—Frequent in the low and lower mixed forests all over Ava and Martaban down to Tenasserim.—Fl. Apr.-May—l.

12. **V. latifolia,** Roxb.; H.f. Ind. Fl. i. 652; Brand. For. Fl. 99.—*Chin-douk-nway-zouk.*—A large tendril-bearing climber, the younger parts pubescent, the branches and branchlets all glabrous; leaves simple, on a 2-4 in. long glabrous petiole, broadly cordate or rotundate, not or more usually 3-5-lobed with the lobes acute or rarely blunt, about 5-6 in. long and broad, acute or rarely blunt, irregularly serrate-toothed, membranous, or almost chartaceous, more or less pubescent along the nerves and veins beneath; flowers purplish, small, on about a line long glabrous pedicels, cymulose, forming an ample-branched glabrous cymose panicle terminating

one of the branches of the 2-cleft glabrous leaf-opposed tendril usually shorter than the leaves; calyx short, truncate, green; petals and stamens 5; stigma sessile; berries globular, the size of a small pea, purplish, smooth, usually 2-seeded.

Hab.—Frequent in the savannahs and savannah jungles, as also in shrubberies and woods round villages, all over the Pegu plains, especially in the Sittang valley.—Fl. Apr.-May.—SS.=All.

13. **V. tomentosa,** Heyne; H.f. Ind. Fl. i. 650.—A large tendril-bearing climber, all parts greyish or tawny woolly; leaves simple, on a slightly woolly petiole 1½ to 3 in. long, rotundate-cordate, 5-nerved at the base, 3-5-lobed or sometimes 3-5-parted, with the lobes more or less acute or rarely blunt, unequally toothed, 5-6 in. long and broad, acute, rarely blunt, membranous; flowers small, on very short and thick woolly petioles, reddish or purplish, compact and cymulose, forming a short usually very dense woolly corymb-like panicle on the one branch of the 2-3-cleft leaf-opposed slightly webby-woolly tendrils; calyx short, obsoletely 5-lobed; petals and stamens 5; stigma sessile; berries the shape and size of a coffee-berry, reddish or purplish, smooth, usually 4-seeded.

Hab.—In deserted hill toungyas of the Martaban hills east of Tounghoo, at 3,000 to 4,000 ft. elevation.—Fl. & Fr. March.—SS.=Metam.

14. **V. lanata,** Roxb.; H.f. Ind. Fl. i. 651.; Brand. For. Fl. 99.—A large tendril-bearing climber, all younger parts softly tawny tomentose; leaves simple, on a 2-3 in. long usually glabrous petiole, broadly cordate or cordate-ovate, the larger ones occasionally angular, about 4-5 in. long, coarsely and unequally toothed, acuminate, almost chartaceous, glabrescent above, rusty or tawny tomentose beneath, rarely pubescent only along the nerves; flowers unisexual, small, greenish, on a line long capillary smooth pedicels, racemulose or almost cymulose, forming an elongate branched woolly panicle, of which usually the one or other branch remains reduced to a tendril; calyx short, 5-lobed; petals and stamens 5, the former calyptrate and very deciduous; filaments long and slender; stigma sessile; berries globular, the size of a small pea, dark-purple, smooth, containing usually 1 or 2 seeds.

Hab.—Not unfrequent in deserted toungyas, etc., of Martaban and Tenasserim; also Chittagong—Fl. Fr. Febr.-March.—SS.=Metam.

N. B.—**V. vinifera,** L. (Brand. For. Fl. 98)—*Sa-pyit*—is often seen cultivated with Europeans, and is said to bear good grapes in Ava.

15. **V. Helferi,** Laws. in H.f. Ind. Fl. i. 662.—A large tendril-bearing climber, all younger parts webby-tomentose and partially glabrescent; leaves usually 5-foliolate with the two lateral leaflets pedately divided into two, on a 3-4 in. long woolly petiole; leaflets

lanceolate or oblong-lanceolate, on woolly petiolules ½-¾ in. long, 5-6 in. long, coarsely serrate-toothed, more or less acute at the base, finely acuminate, when adult coriaceous, more or less tawny woolly along the nerves beneath; flowers small, sessile, and almost immersed, racemulose, forming a raceme-like, elongate, slender panicle either terminating one or both branches of the leaf-opposed little tomentose tendril of the length of the leaves or thereabouts; stigma sessile.

Hab.—Tenasserim.

LEEA, L.

Calyx 5-toothed. Petals 5, united at the base and with the 5-lobed or 5-cleft staminal tube. Filaments inserted between the lobes of the tube and turned inwards. Ovary inserted on the disk, 3-6-celled, with a solitary ovule in each cell. Berry 3-6-celled. Seeds erect, with a hard testa.—Little trees or erect shrubs or undershrubs, with simple or variously pinnate or decompound leaves. Flowers small, in leaf-opposed corymbose cymes.

× *Leaves ample, simple, or rarely 3-foliolate.*

Leaves simple, large, very glaucous and shortly puberulous beneath; lobes of staminal tube entire . . . . . *L. macrophylla.*

Leaves usually pinnately 3-foliolate, hardly glaucescent and minutely puberulous beneath; lobes of staminal tube notched *L. latifolia.*

× × *Leaves from simply pinnate to decompound.*

○ *All parts (except the inflorescences of a few species) glabrous.*

† Inflorescence with persistent and conspicuous bracts and bractlets; flowers sessile or nearly so *L. compactiflora.*

†† Bracts and bractlets minute, usually already dropped before the flower-buds are properly developed.

△ Leaves coriaceous. Flowers greenish-white.

Leaves dark-green; lobes of staminal tube erect, notched; seeds even and convex on back . . . . . *L. sambucina.*

Leaves dark-green; lobes of staminal tube reflexed, acuminate; seeds keeled and tubercled-ribbed . . . . . *L. gigantea.*

Leaves glaucous, the leaflets usually linear or lanceolate; lobes of the staminal tube erect, notched; seeds smooth and rounded on the back . . . . . *L. parallela.*

△ △ Leaves more or less membranous. Flowers red or scarlet.

Leaflets 6-8 in. long; inflorescence rusty-tomentose . . . *L. laeta.*

Leaflets only 2½-4 in. long; inflorescence glabrous or nearly so . *L. coccinea.*

○ ○ *More or less pubescent or stiff-hairy, at least the nerves beneath.*

+ Leaves usually simply pinnate.

Leaflets coarsely serrate, acute, roughish pubescent along the nerves beneath; nerves all parallel; petiolules thick and short; stems, petioles, peduncles, etc., all curled-winged; bracts and bractlets long, lanceolate-subulate . . . *L. crispa.*

Dwarf, all parts robust and densely pubescent or almost tomentose; petioles and petiolules terete; cymes tomentose; bracts minute . . . . . *L. pumila.*

++ Leaves 2- or 3-pinnate.

Leaflets coarsely serrate, acuminate, roughish pubescent on the parallel nerves beneath; stems and petioles terete or nearly so; peduncle compressed-cornered; bracts and bractlets small, linear-lanceolate; flowers greenish white . . . . . *L. aspera.*

All parts stiff-pubescent; leaflets membranous, stiff-pubescent, beneath densely gland-dotted; petioles, etc., all terete; cymes stiff, pubescent; bracts large, broad-ovate, blunt . *L. æquata.*

Almost glabrous or greenish-puberulous; leaves 2-3-pinnate; leaflets puberulous or glabrous, not gland-dotted beneath; bracts and bractlets none . . . . . *L. robusta.*

Petioles, stems, etc., quite glabrous; leaflets small, sprinkled with white stiff hairs; bracts or bractlets none . . . . *L. rubra.*

1. **L. compactiflora,** Kz.—An evergreen treelet (12—15 + 4—8 + ½), all parts glabrous; leaves twice pinnate, on a long terete petiole, glabrous; leaflets linear- to oblong-lanceolate, on sharply 4-cornered petiolules 2-3 lin. long, blunt at the base, 4-6 in. long, long acuminate, serrate, chartaceous; flowers small, greenish white, sessile, seated between the broad, short, scaly bracts, forming head-like clusters arranged in a short peduncled rusty-tomentose glabrescent corymbose cyme shorter than the petiole; petals about a line long, acute; lobes of staminal tube truncate (?)

Hab.—In the moister hill forests of the Martaban hills east of Tounghoo, at 3,000 to 4,000 ft. elevation.—Fl. Apr.-May.—s.—SS.=Metam.

2. **L. sambucina,** Willd.; Brand. For. Fl. 102.—*Kalet.*—An evergreen tree (15—20 + 6—10 + ½—1), sometimes remaining shrubby, all parts glabrous; bark brown, thin, uneven, somewhat corky rough; cut brownish; leaves decompound-pinnate, those at the extreme branches more and more simply-pinnate, on a somewhat compressed glabrous petiole; leaflets oblong- or ovate-lanceolate and lanceolate, on rather slender petiolules, coarsely crenate-serrate, acuminate, thin coriaceous, quite glabrous and glossy, turning blackish in drying, the nerves beneath sharply prominent; flowers small, greenish white, on short and thick pedicels, forming an ample spreading 2-3-chotomous shorter or longer peduncled slightly tawny puberulous glabrescent cyme usually of the length of the petioles; floral bracts and bractlets dropped before flowering; calyx-lobes broadly 3-angular-ovate, acute or nearly so, glabrous; petals about a line long, hooded-acute; lobes of the staminal tube notched, not reflexed; berries depressed globular, the size of a pea, usually 6- or fewer-seeded; seeds smooth, convex on the back.

Hab.—Rather rare in the tropical forests of the eastern slopes of the Pegu Yomah, but frequent in those of Martaban down to Tenasserim, up to 2,000 ft. elevation.—Fl. March; Fr. May.—s.—SS.=Metam. SiS.

Remarks.—Wood rather heavy, close-grained, soft, pale-brown, turning darker, with a silvery lustre, the pith medullary, brown, small; soon attacked by xylophages.

3. **L. gigantea,** Griff.—A shrub with a simple stem, or rather a treelet, all parts quite glabrous; leaves very large, supradecompound, on a slightly compressed smooth petiole; leaflets usually large, 6-8 in. long, on ½ an in. (the end-leaflets up to 2 in.) long petiolules, oblong to oblong-lanceolate, abruptly and shortly acuminate, acute at the base, coarsely crenate-serrate, thin coriaceous, quite glabrous, glossy, turning blackish in drying, the nerves beneath prominent; flowers rather small, greenish white, on very short thick pedicels or almost sessile, forming a large spreading 2-3-chotomously branched quite glabrous cyme in the axils of the leaves or at the end of the branches and of the length or longer than the petioles; bracts and bractlets very deciduous and fallen before the proper development of the bud; calyx-lobes short, rounded or almost acute, glabrous; petals reflexed, about a line long; lobes of the staminal tube triangular-lanceolate, acuminate, reflexed at the entire apex; berries depressed-globular, 4-6-seeded, the seeds bluntish-keeled and tubercled-ribbed along the sides.

Hab.—Tenasserim, apparently frequent.—Fl. Aug.-Oct.; Fr. Febr.-March.

4. **L. crispa,** L.; H.f. Ind. Fl. i. 665.—*Kalet-theing.*—A tall shrubby perennial, about 4 to 5 ft. high, the stems and petioles (especially while young) fringed with 6 to 8 narrow much-curled wings, almost glabrous; leaves pinnate or in luxuriant plants sometimes twice pinnate, on a glabrous, very short, stout, and leafy 4-5-winged petiole; leaflets usually in 2 pairs with an odd one, almost opposite, on very short and stout angular-winged petiolules, elliptically or ovate-oblong, about 5-6 in. long, acute, coarsely and sharply crenate-serrate, almost parallely and plaitedly nerved, harshly chartaceous, glabrous above, beneath rough from short appressed hairs along the prominent excurrent nerves and veins; stipules large, falcate; cymes much shorter than the leaves, rather small, somewhat puberulous, branched already from the base or peduncled, the peduncles compressed, angular, and narrowly winged; bracts and bractlets linear-subulate, long; flowers small, greenish white, on short puberulous pedicels; calyx puberulous, 5-toothed, the teeth 3-angular; petals about a lin. long; lobes of the yellowish staminal tube notched; berries depressed-globular, the size of a large pea or larger, smooth, black, containing usually 6 seeds.

Hab.—Frequent in the savannah and lower mixed forests of Pegu and Martaban; also Chittagong.—Fl. May-June.—l.—SS.=All.

5. **L. aspera,** Wall.; H.f. Ind. Fl. i. 665; Brand. For. Fl. 102.—*Thakya-nway-than.*—A treelet (10—15 + 3—5 + ½—1), but usually shrubby, shedding leaves in H.S., the younger branchlets minutely puberulous; stems sometimes as thick as the arm, terete, longitudinally blackish and white-striped and rough from minute

corky warts, medullary within; leaves pinnate, the lowest pinnule on one or on both sides usually pinnately 3-foliolate, the upper leaves gradually turning 3-foliolate; the petiole and rachis slender, obsoletely angled, without wings, slightly puberulous, glabrescent; leaflets in 2 or often only in a single pair, on slender angular petiolules, oblong or ovate-oblong, rounded or obtuse at base, coarsely falcate-serrate, more or less long-acuminate, 6-7 in. long, chartaceous, glabrous above, beneath minutely gland-dotted all over, and the parallel prominent excurrent nerves all shortly pubescent; cymes much trichotomously branched, shorter than the leaves; the peduncle and ramifications compressed, angular, and usually on the one angle fringed with a narrow, straight, membranous wing; bracts and bractlets small, linear-lanceolate, acuminate; flowers small, greenish-white, on short puberulous pedicels; calyx glabrous or nearly so, almost truncately 5-toothed, the teeth broad and short; petals about a line long; lobes of the yellowish staminal tube narrow, notched; berries depressed-globular, the size of a large pea, smooth, bluish black, containing usually 6, rarely fewer, smooth seeds.

Hab.—Common in the mixed forests, especially the upper ones, as also in savannahs, all over Pegu, up to 2,000 ft. elevation.—Fl. May-June; Fr. C.S.—l.—SS.=All. *SiS.*

Remarks.—Pith medullary, very large, the outer wood only 2-3 lin. thick, dark-brown, close-grained.

6. **L. æquata,** L. (*L. hirta,* Hornem.; H.f. Ind. Fl. i. 668).—*Naga-mouk.*—A shrubby perennial, with terete or slightly 6-8 angular stems, all parts more or less pubescent; leaves twice pinnate, the upper ones usually simply pinnate or occasionally simple, the petiole and rachis terete or nearly so, pubescent; leaflets on very short terete petiolules, oblong or elliptically oblong, 5 to 8 in. long, acuminate, serrate, membranous, on both sides (especially along the nerves) covered with short, white, stiff hairs, more or less glabrescent above, beneath copiously gland-dotted; cymes more or less stiff, usually sessile and branched already from the base or shortly peduncled, much trichotomously branched, tawny pubescent or almost hispid; bracts and bractlets large, broadly ovate, blunt; flowers small, white, very shortly pedicelled or almost sessile; calyx puberulous or almost glabrous, the teeth short and blunt; petals about a line long; lobes of the white staminal tube notched; berries depressed-globular, the size of a large pea, smooth, red, usually 6-seeded.

Hab.—Not unfrequent in the tropical and moister upper mixed forests of Arracan and Martaban, down to Tenasserim and the Andamans.—Fl. June-Octob.; Fr. C.S.—s.

SAPINDACEÆ.

Flowers usually polygamous. Sepals 4 or 5, free or united, imbricate or rarely valvate. Petals 4 or 5, rarely one fewer, sometimes minute or wanting, frequently bearing a basal scale inside. Disk various, sometimes unilateral, rarely wanting. Stamens 8, rarely fewer or more, inserted round the ovary within the disk or sometimes unilateral; anthers erect or versatile. Ovary entire or lobed, 1-4 (usually 3-) celled, with 1 or 2 or rarely more ascending or rarely almost horizontal ovules in each cell; style simple or more or less divided. Fruit dry or succulent, dehiscent or indehiscent, entire or separating into lobes or cocci. Seeds with or without an arillus. Albumen none.—Trees or shrubs, rarely twiners, with alternate compound or decompound rarely simple leaves; flowers usually small and inconspicuous, variously arranged.

The majority of *Sapindaceæ* are readily recognised by having the disk outside, not inside the stamens, and by the 8 stamens in a 5-merous flower with a 3-merous ovary. Several produce delicious fruits, like the litchi, rambutan, longan, etc. Some possess poisonous principles, while others are used as astringents. The fruits of others are saponaceous and used instead of soap. *Acer saccharinum* in North America yields sugar. Nearly all the Burmese species are woody, and mostly trees, some of which yield valuable timber.

* *Fruit dry, dehiscing or indehiscent.*
× *Fruit a capsule, dehiscing loculicidally. Petals present.*
○ Ovules solitary in each cell. Flowers regular.
Capsule coriaceous; cotyledons flat . . . . . *Cupania.*
Stamens 10, short; capsule woody . . . . . *Paranephelium.*
○ ○ Ovules 2 or more in each cell.
Flowers irregular; calyx bell-shaped or tubular; leaves digitate . *Aesculus.*
Flowers regular; capsules 2-valved; leaves pinnate . . . *Harpullia.*
× × *Fruit an indehiscent samara or a capsule dehiscing septicidally. Petals none or present.*
Fruit consisting of 2 indehiscent samaras . . . . . *Acer.*
Fruit a septicidal capsule; leaves simple . . . . . *Dodonæa.*
Fruit a septicidal capsule; leaves pinnate . . . . . *Zollingeria.*
* * *Fruit indehiscent, drupaceous, sappy, fleshy, or rarely crustaceous.*
× *Fruit entire, 1-4 celled.*
+ Without petals; calyx small, the lobes valvate or nearly so; seeds arillate . . . . . *Schleichera.*
+ + With petals. Sepals imbricate.
○ Albumen none. Stamens inserted within the disk.
Scale of the petals crested on the back; disk unilateral . . *Hemigyrosa.*
Scale of the petals cucullate . . . . . *Lepisanthes.*

○ ○ Albumen present; stamens inserted outside to the base of the disk . *Turpinia.*

× × *Fruit divided to the base into several lobes, the latter often solitary by abortion of the others.*

\+ Calyx 4-or 5-toothed or-parted. Seeds arillate.

Calyx small, cup-shaped; petals none or various; stamens long-exserted . . . . . *Nephelium.*

Calyx cup-shaped, 4-5-cleft; petals 4-5, without a scale; stamens 4-8, long-exserted . . . . . *Pometia.*

\+ + Sepals free, broadly imbricate in 2 series. Arillus none.

○ Leaves pinnate.

× Flowers regular.

Carpels tubercled, dry . . . . . *Xerospermum.*

Carpels smooth and sappy . . . . . *Sapindus.*

× × Flowers irregular.

Fruit-lobes globose; testa of seeds bony . . . . *Dittelasma.*

Fruit-lobes oblong; testa of seeds membranous . . . . *Pancovia.*

○ ○ Leaves 1-3-foliolate . . . . . *Allophylus.*

CUPANIA, L.

Flowers polygamously dioecious, regular. Sepals 4-5 (rarely 3 or 6), or united into a cup-shaped calyx, broadly imbricate. Petals as many as sepals or none, with or without a scale inside. Disk usually annular. Stamens often 8-10, inserted inside the disk; filaments short or long. Ovary 2-3 rarely 4-celled, with a solitary ovule in each cell. Capsule obversely ovoid or rarely globose, coriaceous or hard, 2-3 (rarely 4) -celled, often angular or lobed, opening loculicidally. Seeds more or less arillate. Cotyledons plano-convex.—Trees or rarely tall shrubs, with alternate pinnate leaves. Flowers small, in axillary or terminal panicles.

\+ *Capsules clavate-pyriform, more or less conspicuously 3-lobed or angular, coriaceous.*

∗ *Petals present, furnished with a double scale.*

× Leaves and panicles glabrous.

Leaflets opaque, glaucescent beneath, the nerves thin; rachis narrowly winged upwards . . . . . *C. Griffithiana.*

Leaflets glossy, one-coloured, strongly nerved and net-veined; rachis terete . . . . . *C. glabrata.*

× × Leaflets beneath and panicle shortly tawny pubescent.

Leaflets chartaceous, fuscescent in drying, opaque . . . *C. fuscidula.*

∗ ∗ *Petals none or minute, without scales.*

Net-veination minute and obsolete; filaments glabrous; leaflets in 2 pairs . . . . . *C. Lessertiana.*

Net-veination strong and prominent on both sides; filaments exserted, pubescent; leaflets not fuscescent . . . . *C. Sumatrana.*

Net-veination thin, but prominent; filaments short, pubescent; leaflets fuscescent . . . . . *C. Helferi.*

\+ + *Capsule to near the base divided into two divergent lobes, coriaceous.*

Leaflets chartaceous, reddish fuscous beneath, glabrous; panicles tawny puberulous . . . . . *C. adenophylla.*

1. **C. Griffithiana,** Kz. (*C. pleuropteris,* H.f. Ind. Fl. i. 677, not Bl.).—An evergreen middling-sized tree, all parts glabrous; leaves glabrous, abruptly pinnate; the rachis semi-terete, marginate towards the end, but not winged; leaflets almost alternate, rarely opposite, in 2-3 pairs, oblong-lanceolate, usually obliquely so, decurrent on the very short petiolule, bluntish acuminate, 3-4 in. long, entire, coriaceous, beneath turning glaucous-brown in drying; flowers small, in short, slender, glabrous, axillary panicles; sepals almost orbicular, ciliate; petals spatulate-oblong, glabrous, with a woolly 2-cleft scale inside above the claw; stamens somewhat exserted; capsules about 8 lin. in diameter, shortly tapering at the base, glabrous, 3-lobed, the lobes divaricate, broadly rotundate.

Hab.—Tenasserim.

2. **C. glabrata,** Kz.; H.f. Ind. Fl. i. 676.—An evergreen tree, (20—30 + 8—10 + 2—3), all parts glabrous; leaves abruptly pinnate, on rather short petioles, quite glabrous and glossy; leaflets usually in 2 pairs, lanceolate to oblong-lanceolate, acuminate at both ends, 4-7 in. long, entire, firmly chartaceous, laxly but strongly net-veined, glossy; flowers small, white, on a line long pedicels, clustered, forming glabrous, simple or compound panicles in the axils of the leaves; sepals 5, obovate-rotundate, glabrous, villous-fringed, the 2 outer larger ones nearly a line long; petals 5, about ½ lin. long, linear-spatulate, glabrous outside, the whole inner side densely white-woolly; stamens 8; filaments villous to half-way up; ovary tawny-hirsute.

Hab.—Rather frequent in the tropical forests along the eastern slopes of the Pegu Yomah and Martaban.—Fl. Apr.-May.—s.—SS.=SiS. Metam.

3. **C. fuscidula,** Kz.; H.f. Ind. Fl. i. 677.—A small evergreen tree, all parts puberulous; leaves usually abruptly, rarely unpaired-pinnate, the rachis not winged, rusty pubescent; leaflets alternate, unequal and almost falcate, oblong-lanceolate, somewhat decurrent on the very short thick petiolule, about 4 in. long, apiculate, entire, chartaceous, turning blackish in drying, softly puberulous on both sides, especially beneath; flowers small, forming axillary rusty pubescent panicles shorter than the leaves; sepals oblong-rotundate, ciliate, and usually sprinkled with appressed stiff hairs; petals broadly oblong, bearing a 2-cleft woolly scale above the claw; stamens hardly exserted.

Hab.—Tenasserim.

4. **C. Lessertiana,** Camb.; H.f. Ind. Fl. i. 678.—An evergreen tree (30—40 + 10—15 + 3—4), all parts glabrous; leaves usually abruptly pinnate, together with the almost terete rachis quite

glabrous; leaflets in 2-3 (sometimes a single) pairs, opposite or nearly so, ovate-oblong to ovate-lanceolate, on rather long petiolules, acute, and a little decurrent at the base, bluntish acuminate, entire, coriaceous, elegantly net-veined, glossy above; flowers minute, apetalous, in simple or branched puberulous racemes often collected into larger terminal panicles; calyx puberulous; filaments quite glabrous, long and slender, the anthers comparatively large; capsules pear-shaped, sharply 3-cornered, much tapering at the base, while young sprinkled with minute hairs.

HAB.—Frequent in the tropical forests of South Andaman.—Fl. May-June.—s.—SS.=chloritic and serpentine rocks.

5. **C. Sumatrana,** Miq.; H.f. Ind. Fl. i. 678.—An evergreen tree, all parts glabrous; leaves pinnate, the terete rachis half-terete towards the end; leaflets in 2-4 pairs, shortly petioluled, oblong-lanceolate, 5-9 in. long, bluntish acuminate, entire, chartaceous, glabrous, shining above, strongly and elegantly net-veined on both sides; flowers apetalous, minute, forming large axillary and terminal minutely rusty-tomentose panicles; calyx pubescent, the teeth triangular-acute; capsules 3-sided-pear-shaped, much tapering at the base, glabrous.

HAB.—Rare in the tropical forests of the Pegu Yomah; also Tenasserim.—Fr. Apr.-May.—s.—SS.=SiS.—Metam.

6. **C. Helferi,** Hiern; H.f. Ind. Fl. i. 679.—Probably an evergreen tree; leaves abruptly pinnate, the rachis terete; leaflets in two pairs, elliptically oblong, on $\frac{1}{4}$-$\frac{1}{3}$ in long petiolules, almost acuminate, 5-8 in. long, obtuse at the base, glabrous, delicately net-veined; flowers 5-merous, on short spreading "racemes" (pedicels?) arranged in racemose pubescent almost terminal panicles longer than the leaves; calyx cleft, almost valvate, $\frac{1}{8}$ in. in diameter, the lobes ovate; petals none; stamens 8, filaments pubescent; ovary pear-shaped, stalked, not lobed, pubescent.—(From Hooker's Fl. Ind.)

HAB.—Tenasserim.

6. **C. adenophylla,** Planch.; H.f. Ind. Fl. i. 677.—A small evergreen tree, 25-30 ft. high, the young branchlets minutely rusty-puberulous; leaves abruptly pinnate; the rachis slightly rusty-puberulous, soon glabrescent; leaflets in 2-3 pairs, opposite or nearly so, elliptically-lanceolate or lanceolate, on a short and rather thick petiolule, acuminate, with the point bluntish or notched, entire, almost coriaceous, glabrous, turning reddish-brown in drying, bearing glands in the nerve-axils beneath; flowers minute, yellowish, forming axillary short rusty-puberulous panicles; calyx 5-toothed, somewhat hairy outside, the teeth short and ciliate; petals minute, a little longer than the calyx, broadly cuneate, obliquely notched

or 2-cleft, pubescent on the inner face; filaments pilose, anthers puberulous; capsules coriaceous, glabrous, compressed 2-lobed, the lobes oblong, blunt, very compressed, bearing the persistent style in the sinus, one of the lobes usually much smaller or abortive.

Hab.—Tenasserim.

PARANEPHELIUM, Miq.

Flowers polygamous. Calyx cup-shaped, 5-parted, valvate and slightly imbricate at the tips. Petals 5, sessile, furnished with a large broad basal scale inside. Disk crenulate, central, hairy. Stamens 6-10; filaments short. Ovary 3-celled, with a solitary ovule in each cell; style very short and thick; the stigma densely villous. Capsule woody, globular, aculeate-muricate or tubercled, 3-valved.—Trees, with pinnate leaves. Flowers small, in small axillary panicles.

1. **P. xestophyllum,** Miq.—A small evergreen tree, the young shoots slightly puberulous; leaves pinnate, glabrous, the rachis tawny puberulous, soon glabrescent; leaflets in 2-3 pairs, with or rarely without an odd one, on a rather short and thick slightly puberulous petiolule, oblong to oblong-lanceolate, apiculate, almost coriaceous, smooth and glossy on both sides; flowers minute, in rusty-tomentose short axillary panicles; calyx rusty-tomentose, the teeth 3-angular-acute; anthers glabrous; capsules almost globose, about an in. in diameter, woody-muricate, loculicidally 3-valved, the valves remaining coherent with their inner margins.

Hab.—Upper Tenasserim.

ÆSCULUS, L.

Flowers irregular, polygamous. Calyx bell-shaped or tubular, 5-cleft, the lobes irregular and imbricate. Petals 4 or 5, unequal, clawed, without an appendage, imbricate. Stamens 5-8, inserted within the annular or one-side disk. Ovary 3-celled, with 2 ovules in each cell. Capsule coriaceous, smooth or echinate, loculicidally 3-valved. Seeds large, not arillate.—Trees, with opposite digitate leaves. Flowers rather large, in panicles or racemes.

1. **Æ. Assamica,** Griff. (*Æ. Punduana,* Wall.; H.f. Ind. Fl. i. 675).—A large tree; leaves large, digitately 5-7-foliolate; leaflets oblong-lanceolate to cuneate-oblong, cuneate and somewhat decurrent at the base, acuminate, shortly petioluled, serrulate, glabrous, on both sides green; flowers rather conspicuous, white, pale rose-coloured at the base, racemose, forming an axillary velvety panicle; calyx tubular, velvety; stamens long, exserted; capsules obovoid, smooth, about 1½ in. long, apiculate, leathery, brown.

Hab.—Damp hill forests of Upper Tenasserim.

HARPULLIA, Roxb.

Flowers regular, polygamous. Sepals 4 or 5. Petals as many, without any scale, but sometimes with basal inflexed auricles. Stamens 5-8, inserted within the conspicuous disk. Ovary 2-celled, with 2 ovules in each cell; style short or elongate and spirally twisted. Capsule coriaceous or chartaceous, somewhat compressed, 2-or rarely by abortion 1-lobed, the lobes inflated, loculicidally 2-valved. Seeds with or without arillus. Cotyledons thick.—Trees, with pinnate leaves. Flowers rather small or middling-sized, panicled.

1. **H. cupanioides,** Roxb.; H.f. Ind. Fl. i. 692 (H. *imbricata,* Bl.; Bedd. Sylv. Madr. t. 158).—A tree (80—90+50—60+6—14), evergreen or in drier tracts shedding leaves in the H.S., the younger parts tawny puberulous; leaves pinnate; the rachis slightly puberulous; leaflets 6-8 in. long, alternate, on short but slender petiolules, in 3 to 7 pairs, somewhat obliquely oblong or elliptically lanceolate, usually oblique at the acute base, bluntish acuminate, entire, membranous, puberulous on the principal nerves, soon glabrous; flowers comparatively large, in lax, slender, slightly puberulous panicles; sepals broadly oblong, blunt, tawny tomentose; petals white; disk puberulous; capsules broadly cordate, 2-lobed, the lobes inflated, reddish, glabrous, usually 2-seeded.

Hab.—Frequent in the tropical forests of the Andamans; also Chittagong.—Fl. June.—s.—SS.=SiS.

DODONÆA, L.

Flowers often dicœcious or polygamous. Sepals 5, rarely fewer, valvate. Petals none. Disk small or obsolete. Stamens usually 8, sometimes fewer, rarely 10; filaments very short. Ovary 3-4 (rarely 5-6) -celled, with 2 ovules in each cell. Capsule membranous or coriaceous, opening loculicidally in as many valves as cells, usually winged. Seeds funicled. Embryo spirally curled.—Shrubs, with simple, entire, or rarely lobed leaves, the young shoots usually sticky. Flowers small.

1. **D. viscosa,** L.; H.f. Ind. Fl. i. 697; Bedd. Sylv. Madr. 75, t. 11, f. 2; Brand. For. Fl. 113.—A shrub, the cornered branches and younger shoots sticky; leaves varying from obovate-lanceolate to linear-lanceolate, tapering at the base, 2-4 in. long, blunt to acute, almost entire, with the margins often revolute, coriaceous, while young sticky; flowers small, greenish, on long slender pedicels, forming terminal and axillary short glabrous racemes; sepals ovate; stamens 5, rarely 8; style very short; capsules compressed, broadly 2-winged, rotundate-obcordate, about ½ in. across.

Hab.—Sandy shores of Tenasserim from Amherst to Mergui; also Narcondam island, Andamans.—Fr. March.—l.

ZOLLINGERIA, Kz.

Flowers hermaphrodite. Sepals 5, imbricate, the 2 inner ones larger. Petals 5, almost clawed, with a basal woolly scale inside. Stamens 8, inserted round the ovary; filaments long, but not exserted. Ovary 3-sided-conical, 3-celled, with a solitary or 2 ovules in each cell. Capsules chartaceous, usually 3-winged, and (by maceration of the cell-walls) 1-celled, 1-2-seeded. Seeds without albumen. Cotyledons large, folded.—Trees, with pinnate leaves. Flowers small, in axillary or terminal panicles.

1. **Z. macrocarpa**, Kz.; H.f. Ind. Fl. i. 692.—*Wet-kyot-pen.*—A tree (50—80 + 25—50 + 3—6), leafless in the H.S., the young shoots tawny pubescent; bark about an in. thick, grey, roughish, breaking up into small tubular pieces; cut dry, pale-coloured; leaves usually unpairedly, rarely almost abruptly pinnate, glabrous; leaflets alternate, more or less unequal at the base, lanceolate to oblong-lanceolate, on a 2-3 lin. long petiolule, bluntish acuminate, 5-8 in. long, chartaceous, entire; flowers small, white, on 2 lin. long pedicels, forming short, somewhat nodding, glabrous or very slightly hairy panicles in the axils of the leaves or at the end of the branches; sepals about a lin. long, obovate, ciliolate, slightly notched; petals nearly 2 lin. long, glabrous except the villous base, ciliate, oblong, blunt, the woolly blunt scale adhering to the broad claw; filaments hairy; ovary slightly pubescent at the very base; capsules oblong, at the base surrounded by the disk, about 2 in. long, glabrous, 3- or rarely by abortion 2-winged; the wings broad, striate, rounded at the somewhat narrowed base, truncate at the broader end with the edges rounded.

Hab.—Not unfrequent in the mixed dry forests of the Prome district.—Fl. probably C.S. (?); Fr. March.—l.—SS.=CaS.

Remarks.—Wood white.

ACER, L.

Flowers regular, often polygamous. Calyx usually 5- (rarely 4-12) parted, deciduous, imbricate. Petals as many or sometimes entirely wanting. Stamens often 8, rarely 4-12, inserted outside or within the annular lobed disk. Ovary 2-lobed and 2-celled, with 2 ovules in each cell; styles 2, rarely 3. Fruit separating in 2-winged indehiscent samaras. Albumen none.—Trees, rarely shrubs, with opposite, simple, or palmately lobed leaves. Flowers small, in terminal or axillary racemes or corymbs.

× Leaves simple, not lobed, with 3 basal nerves.

Leaves usually whitish beneath, the petiole 1-2 in. long; cymes glabrous; branchlets blackish . . . . . *A. laurinum.*

Leaves one-coloured, the petiole 3-6 lin. long; cymes panicled, glabrous; branchlets pale brown . . . . . *A. lævigatum.*

× × Leaves 3-lobed and 3-nerved.

Glabrous; lobes of leaves long, acuminate, entire . . . *A. isolobum.*

1. **A. niveum,** Bl.; H.f. Ind. Fl. i. 693.—An evergreen (?) large tree, all parts glabrous; leaves ovate to ovate-oblong, rounded or obtuse at the base, on a long slender petiole, acuminate, entire, coriaceous, whitish beneath; flowers small, in racemose glabrous corymbs; stamens 6; samaras glabrous, the wings about an in. long and somewhat spreading.

Hab.—Frequent in the damp hill forests of the Martaban hills, east of Tounghoo, down to Tenasserim, at 4,600 to 6,000 ft. elevation.—s.—SS.=Metam.

2. **A. laevigatum,** Wall.—A tree, all parts glabrous; leaves ovate or oblong, rounded at the base, on a slender petiole $\frac{1}{3}$-$\frac{1}{2}$ in. long, entire, glabrous, one-coloured, 3-nerved at the base and penninerved; flowers small, cymose, forming glabrous panicles appearing with the young foliage; carpels glabrous, 1-1$\frac{1}{4}$ in. long, the wings veined, slightly diverging, dilated above, usually curved on the back.

Hab.—Hills of Upper Tenasserim.

3. **A. isolobum,** Kz.; H.f. Ind. Fl. i. 694.—An evergreen (?) tree (50—60+20—30+3—5), all parts glabrous; leaves palmately 3-lobed, 5-6 in. long and broad, rounded at the 3-nerved base, long petioled, glabrous, net-veined, the lobes spreading and acuminate; flowers and fruits unknown.

Hab.—Frequent in the damp hill forests of Martaban, at 5,000 to 7,000 ft. elevation.—s.—SS.=Metam.

SCHLEICHERA, Willd.

Flowers regular, polygamously dioecious. Calyx inconspicuous, 4-6-cleft, valvate, or obscurely imbricate. Petals none. Disk complete, repand, glabrous. Stamens 6-8, very rarely 4-5, central; filaments elongate. Ovary 3-4-celled, with a solitary erect ovule in each cell. Fruit dry, almost crustaceous, stylose-acuminate, 1-3-celled. Seeds erect, enveloped in a pulpy arillus.—Trees, with alternate abruptly pinnate leaves. Flowers minute, racemose.

1. **Sch. trijuga,** Willd.; H.f. Ind. Fl. i. 681; Bedd. Fl. Sylv. Madr. t. 119; Brand. For. Fl. 105, t. 20.—A tree (50—70+20—30+8—12), leafless in the C.S., the shoots puberulous; bark grey, roughish, when old peeling off in small pieces; cut dry, reddish; leaves usually abruptly pinnate, while young puberulous, soon turning glabrous; leaflets in 2-3 rarely 4 pairs, sometimes with an odd

one, opposite or nearly so, very shortly petioluled or almost sessile, broadly lanceolate or oblong, about 4-8 in. long, bluntish acuminate or apiculate, rarely blunt or notched, entire, chartaceous, elegantly net-veined; flowers minute, apetalous, yellowish green, on rather short pedicels, forming usually axillary solitary racemes shorter than the leaves; drupes dry, the size of a cherry, ovoid or ovoid-oblong, acuminate, smooth, 1-2- rarely 3-seeded.

Hab.—Common in all leaf-shedding forests, especially the mixed ones, from Ava and Martaban down to Tenasserim.—Fl. March-Apr.—l.—SS.= ∞ *SiS.*

Remarks.—Wood brown, very heavy, close-grained and durable, takes fine polish. □ ′,=70 pd. Used for cart-wheels, the teeth of harrows, the pestles of oil-mills, etc. Exudes a yellowish resin. Lac is produced on the tree.

HEMIGYROSA, Bl.

Flowers polygamously monoecious, irregular. Sepals 5, the 2 outer ones smaller, broadly imbricate. Petals 5, unequal, furnished with a crested basal scale inside, the 5th not scaled or often wanting. Disk cushion-like, one-sided. Stamens 8, unequal, one-sided, hardly exserted. Ovary excentric, 3-celled. Fruit fleshy or coriaceous, 3-lobed, indehiscent. Seeds not arillate. Cotyledons equal, fleshy.—Trees, with pinnate leaves. Flowers comparatively large, in axillary branched racemes or panicles.

1. **H. canescens,** Thw.; H.f. Ind. Fl. i. 671; Bedd. Sylv. Madr. t. 151.—An evergreen middling-sized tree, the younger parts shortly greyish tomentose; bark ash-coloured, somewhat rough; leaves abruptly pinnate; the rachis slightly puberulous, but soon glabrescent; leaflets in 2 pairs, obovate or oblong, on a short, thick, puberulous petiolule, more or less blunt or bluntish apiculate, entire, chartaceous, glabrous, net-veined; flowers rather large, white, racemose, forming usually greyish-tomentose panicles; sepals rotundate, silvery canescent; petals 4, flat, obovate-oblong, the claws silky on the back, the basal woolly scale 2-cleft, waved or crisped, bearing a cuneate-crested appendage on the back below the cleft; disk crenulate, one-sided; stamens 8, unilateral; fruit fleshy, 3-gonous-ovoid, the size of a bullet, densely greyish velvety.

Hab.—Tenasserim.

LEPISANTHES, Bl.

Flowers regular, polygamously dioecious. Sepals 4-5, imbricate. Petals 4-5, furnished with a cucullate scale on the inner side above the claw. Disk annular, regular. Stamens 8, rarely 9-11, central. Ovary 3-4-celled, with a solitary ovule in each cell. Fruit indehiscent, 3-4-angular, coriaceous or fleshy, 3-4-celled. Seeds without airllus.—Trees with pinnate leaves. Flowers rather small, in axillary and terminal panicles.

Leaves slightly puberulous on the midrib beneath; pedicels 1½-2 lin. long, filiform; scale of petals densely white-villous fringed *L. Burmanica.*
Leaves quite glabrous; pedicels very stout, about ½ lin. long; petals inside and scale glabrous . . . . . *L. montana.*

1. **L. Burmanica,** Kz. (*L. montana,* Hiern.; H.f. Ind. Fl. i. 679, and Kurz Prel. Rep., Pegu, A.-38, not Bl.).—An evergreen tree (20—25+15—20+1—2), the trunk simple and palm-like, not or almost not branched, the shoots puberulous; bark a line thick, smooth, minutely and longitudinally fissured, greyish-brown; cut dry, pale-coloured; leaves 2-3 ft. long, abruptly pinnate, the rachis half-terete, slightly channelled; leaflets almost opposite, elliptically or oblong-lanceolate, obtuse at the base, very shortly petioluled, acute, chartaceous, entire, glabrous or slightly puberulous on the midrib beneath; flowers in large terminal and axillary tawny puberulous racemes forming a large terminal panicle; fruits on a short and thick peduncle, obtusely 3-4-lobed, the size of a bullet, fleshy, densely tawny tomentose, the cell-walls inside mottled, but smooth.

Hab.—Not uncommon in the tropical forests of the eastern and southern slopes of the Pegu Yomah and in Martaban, up to 2,000 ft. elevation.—Fr. Febr.-March.—s.—SS.=SiS. *Metam.*, Lat. p.

Remarks.—Wood white, rather heavy, fibrous but close-grained, soon attacked by xylophages.

2. **L. montana,** Bl. (*L. Browniana,* Hiern.; H.f. Ind. Fl. ii. 680).—A small evergreen tree, all parts glabrous; leaves 1½-2½ ft. long, on a rather slender petiole ½-1 ft. long; leaflets in 7-11 pairs, alternate or sometimes opposite, elliptically oblong to oblong and linear-oblong, cuneate at the base, on glabrous petiolules up to ½ in. long, acuminate, 4-9 in. long, chartaceous, glabrous; flowers rather largish, white, on very stout pedicels about ½ a line long, forming short and dense puberulous racemes arising usually in clusters or almost singly from the axils of the leaves; petals inside and scale glabrous; fruits trigonously ovoid, the size of a wood-apple, puberulous, stylose-acuminate.

Hab.—Tenasserim.

TURPINIA, Vent.

Flowers regular, hermaphrodite. Calyx 5-cleft, imbricate, persistent. Petals 5, imbricate. Stamens 5, inserted outside to the base of the crenate or lobed disk. Ovary 3-lobed and 3-celled, with several (usually 6-8) anatropous ascending ovules in each cell; styles 3, rarely free. Fruits almost globose, fleshy or coriaceous, indehiscent, 3-celled. Seeds albuminous.—Trees or shrubs, with pinnate or rarely 1-foliolate leaves, the leaflets serrulate. Flowers small, in panicles.

Leaves apiculate; flowers about 3 lin. in diameter . . . *T. pomifera.*
Leaves almost caudate; flowers hardly 2 lin. in diameter . . *T. Nepalensis.*

1. **T. pomifera,** DC.; H.f. Ind. Fl. i. 698.—*Touk-sha-ma.*—An evergreen tree (30—40 + 12—20 + 2—3), all parts glabrous; bark rather smooth, about 2 lin. thick, grey, minutely corky lenticellate; cut dryish, pale-coloured; leaves pinnate, glabrous and glossy; leaflets 5-7 in. long, in 2-3 pairs with a long-petioluled odd one, oblong to elliptically oblong, shortly petioluled, acute at the base, apiculate, serrate, coriaceous; flowers small, greenish white, shortly pedicelled, forming trichotomous glabrous panicles in the axils of the upper leaves and shorter than them; sepals and petals rotundate, ciliolate, about 1½ lin. long; fruits globose, especially while young often stylose-3-pointed, fleshy, green, smooth, the size of a large cherry.

Hab.—Frequent in the tropical forests of Pegu and still more so in those of Martaban; also Chittagong.—Fl. Febr.—Fr. C.S.—s.—SS.=*Metam.* SiS.

Remarks.—Wood very pale brown or greyish, rather heavy, fibrous, but close-grained, tolerably soft, soon attacked by xylophages.

2. **T. Nepalensis,** Wall.; Bedd. Sylv. Madr. t. 159.—*Douk-ya-ma.*—An evergreen tree (20—30 + 8—15 + 2—3), all parts quite glabrous; leaves pinnate, quite glabrous and glossy above; leaflets only 3-4 in. long, in 2 or a single pair with a long-petioluled odd one, oblong-lanceolate to lanceolate, acute at the base, acuminate or almost caudate, serrate-toothed, coriaceous; flowers minute, greenish, forming large trichotomous panicles in the axils of the upper leaves and as long or sometimes longer than them; petals and sepals oblong, blunt, ciliolate, hardly a line long; fruits small, scarcely fleshy, usually 3-seeded, stylose-3-pointed.

Hab.—Frequent in the hill forests, especially the drier ones and the pine forests of Martaban, at 3,000 to 7,200 ft. elevation.—Fl. March.—s.—SS.=*Metam.*

NEPHELIUM, L.

Flowers regular, polygamous. Calyx small, cup-shaped, 4-5-rarely 6-toothed or-lobed, valvate or slightly imbricate. Petals none or as many as calyx-lobes, small, furnished with a 2-cleft scale or with 2 distinct scales at the base inside. Stamens 6-10, inserted within the annular disk. Ovary 2-3-lobed and -celled, with a solitary ovule in each cell. Fruit usually deeply 2-3-lobed or by abortion reduced to a single lobe, the lobes indehiscent or hardly 2-valved or rupturing. Seeds more or less completely enveloped by the arillus. Cotyledons thick.—Trees, with pinnate leaves. Flowers small, in axillary or terminal panicles.

* *Petals none. Calyx-toothed.*
○ Fruit covered with fleshy, soft, subulate or angular conical prickles.
Glabrous; leaflets glaucous or whitish beneath; prickles of fruit fleshy, long, conically angular, truncate, glabrous . . . *N. Griffithianum.*

Leaflets more coriaceous, pale beneath or almost one-coloured; prickles of fruit subulate, variously curved and incurved, ½-¾ in. long, glabrous . . . . . *N. lappaceum.*

○○ Fruits tubercled.

Leaflets very coriaceous, small, the net-veination quite obsolete, the nerves thin and faint; fruit-lobes ellipsoid-oblong, the size of a prune, covered with sharp compressed-tesselate tubercles . *N. Litchi.*

∗ ∗ *Petals present. Calyx cleft to ½ or to near the base.*

Leaflets firmly coriaceous, glaucescent beneath, in drying fuscescent, the lateral nerves thin and slightly prominent; fruit-lobes oblong, shortly muricate, the murices about a line long, sharp . . . . . *N. rubescens.*

Leaflets thin coriaceous, more or less glaucescent beneath; fruit-lobes ovoid-oblong, the size of a plum, perfectly glabrous, strongly tubercled as in *N. Litchi*, but not tesselate . . *N. hypoleucum.*

As former, but leaflets usually smaller; fruit-lobes globose, the size of a cherry, obsoletely tubercled, minutely tawny velvety all over . . . . . *N. Longanum.*

Fruits with subulate, long, soft prickles . . . . . *N. lappaceum.*

1. **N. hypoleucum**, Kz.—*Kyet-mouk*—An evergreen tree (30—50+15—25+3—5), the young shoots rusty puberulous; leaves abruptly or more usually unequally pinnate, the rachis almost terete and slightly rusty puberulous while young; leaflets 6-10 in. long, oblong or ovate-lanceolate, usually somewhat oblique, acute at the base, acuminate, nearly coriaceous, glabrous, beneath glaucous and delicately net-veined; flowers minute, pedicelled, forming axillary and terminal tawny puberulous panicles; calyx puberulous, the teeth sometimes ciliate; petals linear-spathulate; filaments long, pilose especially towards the base; fruit-lobes usually solitary by abortion, the shape and size of a plum, yellowish crimson, covered with a muricate-areolate almost crustaceous epicarp, 1-seeded, the seed large, entirely enveloped in the sappy, white, acid-sweet arillus.

Hab.—Rare in the tropical forests of the eastern slopes of the Pegu Yomah, but frequent in those of Martaban, up to 2,000 ft. elevation; also cultivated.—Fl. Jan.; Fr. Apr.—s.—SS.=SiS. *Metam.*, Lat. p.

2. **N. Litchi**, W. A.; H.f. Ind. Fl. i. 687.—*Kyet-mouk.*—An evergreen tree (30—40+12—20+3—4), all parts glabrous; leaves usually abruptly pinnate; leaflets in 6 to 2 pairs, opposite, lanceolate, shortly petioluled, about 3-6 in. long, acuminate, entire, coriaceous, glossy above, glaucous beneath, the net-veination obsolete; flowers minute, greenish, shortly pedicelled, forming a terminal branched usually slightly puberulous panicle of the length of the leaves or longer; petals none; stamens 6-8; filaments and ovary pubescent; style with 2 stigmatic lobes; fruit-lobes usually solitary by abortion, rarely paired, oval, the size of a pigeon's egg, covered by the red muricate-areolate somewhat crustaceous epicarp, 1-seeded; the seed large, completely covered with the sappy, whitish, edible, sweet arillus.

Hab.—Chittagong, cultivated only.—Fl. Febr.-March.

Remarks.—Wood red-brown, rather heavy, close-grained, takes fine polish.

N. B.—**N. rubescens,** Hiern., is said to occur in Tenasserim.

3. **N. Griffithianum,** Kz.—An evergreen tree, the leaf-buds tawny velvety; leaves glabrous, unpaired-pinnate, on a 2-3 in. long glabrous somewhat glaucous petiole; leaflets in 3-4 pairs with an odd one, ovate-oblong to oblong, shortly petioluled, obtuse or nearly so at the unequal base, shortly acuminate, chartaceous, glaucous beneath, the net-veination conspicuous and prominent on both sides; flowers unknown; fruits (according to Griff. racemose) by abortion 1-lobed, the lobe almost sessile, oblong, the size of a small egg, covered by soft angular-compressed conical nearly ½ an in. long prickles, 1-seeded, the seed large, enclosed in a white sappy acid arillus.

Hab.—Ava, hills east of Bhamo.—Fr. May.

4. **N. Longana,** Camb.; H.f. Ind. Fl. i. 689 (*Euphoria Longana,* Lamk.; Bedd. Sylv. Madr. t. 156).—*Kyet-mouk.*—An evergreen tree, (30—50+15—25+4—5), all parts glabrous; leaves abruptly pinnate; leaflets in 3-4 pairs, almost opposite, on a short thick petiolule, lanceolate, about 3-4 in. long, rather blunt, entire, coriaceous, glossy above, glaucous beneath; flowers small, yellowish white, very shortly pedicelled, forming a terminal slightly rusty-puberulous glabrescent panicle of the length of the leaves or longer; petals 5, lanceolate, hairy; stamens 6-8; filaments tomentose; style with 2 or 3 stigmatic lobes; fruit-lobes usually solitary, rarely 2-3, almost globose, the size of a cherry, covered with a brownish grey, roughish areolate, somewhat crustaceous epicarp, 1-seeded, the seed large, entirely enclosed by the sappy, whitish, sweet, edible arillus.

Hab.—Rare in the tropical forests of the eastern slopes of the Pegu Yomah (Khaboung); also cultivated.—Fl. March.—s.—SS.=SiS.

Remarks.—Wood brown, rather heavy, finely close-grained and apparently durable. Good for furniture and takes fine polish.

POMETIA, Forst.

Flowers regular, polygamous. Calyx cup-shaped, 4-5-cleft, valvate. Petals 4-5, without a scale. Stamens 4-8, inserted within the disk, the filaments elongate and exserted. Ovary deeply 2-3-lobed and -celled, with a solitary ovule in each cell; style twisted. Fruit-lobes 1-2, dry or drupaceous, indehiscent. Seeds enclosed in a mucous arillus.—Trees, with pinnate leaves, the lowermost leaflets much smaller and almost stipule-like. Flowers small, in racemes or panicles.

1. **P. tomentosa,** Bth. & H.f.; Hf. Ind. Fl. i. 691.—An evergreen tree (80—90+40—45+6—10), the shoots and younger parts rusty pubescent; leaves abruptly or unpaired-pinnate, 1-3 ft. long, while young puberulous beneath, soon quite glabrous, the rachis rusty-pubescent, glabrescent; leaflets in 4-9 pairs, alternate or rarely the upper ones almost opposite, ovate-oblong to oblong-lanceolate, 6-7 (in young trees 15-18) in. long, on short and thick rusty-pubescent petioles, usually narrowed towards the rounded base, remotely and irregularly serrate, acuminate, membranous, while young the midrib and the under-surface puberulous, soon glabrescent, the lowest pair of leaflets almost orbicular and stipule-like reduced; flowers minute, racemose, in terminal and axillary rusty puberulous panicles; fruits 1- or 2-lobed, the lobes elliptically oblong, smooth, the size of a plum.

Hab.—Very common in the tropical forests of the Andamans.—Fr. May-June.—s.—SS.=SiS. *Metam.*

Remarks.—Wood whitish, very light, and very coarsely fibrous.

XEROSPERMUM, Bl.

Flowers regular, polygamously-dioecious. Sepals 4, imbricate, the outer ones smaller. Petals 4, without a scale. Disk annular, fleshy. Stamens 8; the filaments filiform. Ovary didymous, 2-celled, with a solitary ovule in each cell. Fruit 1- or 2-lobed, the lobes diverging and tubercled. Seeds without arillus, the testa pilose, fleshy outside and arillus-like.—Trees, with pinnate or pinnately 3-foliolate leaves. Flowers small, in almost simple axillary or terminal racemes.

1. **X. Noronhianum,** Bl.; H.f. Ind. Fl. i. 686.—A small evergreen tree, the young shoots puberulous; leaves abruptly pinnate or often pinnately 3- or 2-foliolate; leaflets oblong or elliptically oblong, almost opposite, 6-7 in. long, acute at the base, on a short and strong petiolule, acuminate, entire, coriaceous, glabrous, glossy, strongly-netveined; flowers small, greenish, forming short, almost simple glabrous racemes arising singly or by 2-3 from the axils of the leaves or sometimes crowded towards the end of the branches; fruit-lobes 1 or 2, the shape and size of a plum, coriaceous, densely muricate.

Hab.—Tenasserim.

PANCOVIA, Willd.

(*Erioglossum,* Bl.)

Flowers more or less irregular, polygamous. Sepals 5, broadly imbricate. Petals 4, shortly clawed, with a hooded scale inside.

Disk one-sided, lobed. Stamens 8; filaments short. Ovary 3-lobed, 3-celled, with a solitary ovule in each cell. Fruit fleshy or coriaceous, divided into 1-3 indehiscent lobes or rarely 1-lobed by abortion. Seeds oblong, without arillus. Cotyledons thick.—Trees, with pinnate leaves. Flowers comparatively rather large, in terminal and axillary panicles.

Sepals rotundate, blunt, petals elliptical, rounded, the scale hooded . *P. rubiginosa.*
Sepals oblong-lanceolate; petals elongate-cuneate, the scale 2-cleft . *P. tomentosa.*

1. **P. rubiginosa,** Baill. (*E. rubiginosum,* Brand. For. Fl. 108; *E. edule,* Bl.; H.f. Ind. Fl. 672; Bedd. Fl. Sylv. Madr. 73).—*Tseik-chay.*—An evergreen tree (25—30 + 8—15 + 2—3½), all softer parts more or less softly tawny pubescent; bark 2-3 lin. thick, lenticellate-rough, greyish, peeling off in irregular brittle flakes; cut reddish; leaves abruptly pinnate; leaflets in 6-4 pairs, almost opposite, oblong-lanceolate, about 4-5 in. long, shortly petioluled, more or less acuminate, entire, glabrous above, pubescent beneath; flowers rather small, white, shortly pedicelled, racemose, forming an ample rusty or tawny tomentose terminal panicle; sepals coriaceous, pubescent; petals somewhat longer, furnished with a woolly scale; style simple, slender; berries often by threes or fewer by abortion, oblong, the size of a small bean, smooth, purplish black, 1-seeded.

Hab.—Frequent in the tropical, rare in the moister mixed forests, from Pegu and Martaban down to Tenasserim and the Andamans.—Fl. March-Apr.; Fr. May-June.—s × l.—SS. = ∞.

Remarks.—Wood white or pale-coloured with pinkish brown heart-wood, strong and durable. Adapted for house-building.

2. **P. tomentosa** (*Sapindus tomentosus,* Kz.).—Probably a tree, all softer parts pubescent; leaves pubescent or shortly tomentose, abruptly pinnate; leaflets in 4 to 3 pairs, obliquely ovate-oblong, shortly petioluled, 4-5 in. long, acute at the unequal base, acuminate or acute, entire, chartaceous, glabrous except on the nerves above, shortly and densely tomentose beneath; panicle shortly tomentose, terminal; sepals oblong-lanceolate, acute, pubescent outside; petals elongate-cuneate, shortly villous towards the base, the blade obovate, bearing at the middle a 2-cleft scale densely woolly inside; filaments long-pilose; style simple, continuous; unripe drupes peduncled, 2- or by abortion usually 1-lobed, stylose-acuminate, 1-seeded; seed erect; radicle linear, straight.

Hab.—Ava, Khakhyen hills.

DITTELASMA, Hf.

Flowers irregular, polygamously monoecious. Sepals 5, broadly imbricate. Petals 4, with a large scale inside. Disk half-crescent-annular, glabrous. Stamens 8; filaments shaggy. Ovary glab-

rous, 3-celled and 3-lobed, with a solitary ovule in each cell. Drupe 1-3-coccous, fleshy. Seeds globose, the testa bony.—Trees, with pinnate leaves and panicled flowers.

1. **D. Rarak,** H.f. Ind. Fl. i. 672.—An evergreen tree (50—60 + 25—30 + 4—5), all parts glabrous; leaves 1½-2 ft. long, abruptly or unpaired-pinnate, the petiole semiterete and smooth; leaflets in 7-10 and more pairs, almost opposite or alternating, on hardly a line long petiolules, almost falcate, oblong-lanceolate, acute at the base, 3-5 in. long, acuminate, entire, membranous, lively green and glabrous; flowers rather small, irregular, greenish white, polygamously-dioecious, shortly pedicelled, forming an ample terminal tawny velvety panicle; calyx appressed tawny pubescent; the sepals very unequal, the 2 upper ones largest and collateral, opposite to the fifth wanting petal; petals 4, oblong-lanceolate, about a line long, appressed pubescent outside, ciliate, the scale almost as long as the petal and very villous; stamens 8; the filaments hairy, glabrous towards the apex, somewhat exserted; ovary glabrous; fruits by abortion usually 1- or 2-lobed, orange-coloured, smooth, fleshy, the lobes oblong or elliptically oblong, 1-seeded; seed large, almost globose.

Hab.—Rather rare in the tropical forests of the Pegu Yomah (in the Gyo Gyo valley, Kambala Toung); Tenasserim.—s.—SS.=SiS.

SAPINDUS, Plum.

Flowers regular, polygamous. Sepals 4-5, broadly imbricate. Petals 4-5, with or without scales. Disk complete, annular. Stamens usually 8-10, inserted within the disk. Ovary 2-4-lobed and 2-4-celled, with a solitary ovule in each cell; style terminal; stigma 2-4-lobed. Fruit 1-2-3-coccous, fleshy or coriaceous, the cocci indehiscent. Testa of seeds membranous or crustaceous. Cotyledons thick.—Trees or shrubs, with pinnate or simple leaves. Flowers in terminal and axillary panicles.

* *Leaves 2-foliolate.*

Panicles slender, pubescent; fruit-lobes 1½-2 lin. long . . . *S. microcarpus.*

* * *Leaves pinnate or simple, or rarely simple and semi-pinnate on the same plant.*

Leaves pinnate, long-petioled, remote; flowers pink . . . *S. ruber.*

Leaves simple, almost sessile, crowded; flowers white . . . *S. Danura.*

1. **S. microcarpus,** Kz.—Probably a tree, the shoots sparingly hirsute; leaves 2-foliolate, on a sparingly hirsute petiole only 1-2 lin. long; leaflets oblong to linear-oblong, acuminate at the oblique base, 2-3½ in. long, rather blunt or almost retuse, entire, coriaceous, glabrous, prominently net-veined on both surfaces; flowers small, glabrous, on ½ lin. long pedicels, forming slender pubescent and soon glabrescent panicles in the axils of the leaves and at the end

of the branchlets; berries usually deeply 2- or by abortion 1-lobed, the lobes obovate, diverging, 1½-2 lin. long, glabrous.

Hab.—Adjoining Siamese province of Kanbooree.—Fr. Apr.-May.

2. **S. ruber** (*Scytalia rubra*, Roxb.; *S. attenuatus*, Wall.; H.f. Ind. Fl. i. 684).—A large evergreen shrub or small tree, all parts quite glabrous; leaves abruptly or almost abruptly pinnate, glabrous, the rachis and petiole terete; leaflets in 4-5 or fewer pairs lanceolate to ovate-lanceolate, somewhat unequal at the acute or acuminate base, shortly petioluled, 3-4 in. long, long but bluntish acuminate, chartaceous, glabrous; flowers small, purple, on slender pedicels, forming ample lax axillary or supra-axillary glabrous panicles; sepals ½ lin. long, lanceolate, acuminate; petals concave-rotundate, 2 lin. long, rounded the scale present or obsolete; stamens not exserted, the filaments almost wanting; ovary 2-lobed; fruit 2-1-lobed, the lobes ellipsoid, the size of an olive, glabrous, dark purple; seeds covered with an edible arillus.

Hab.—Forests of the Chittagong hills.

3. **S. Danura**, Voigt.; H.f Ind. Fl. i. 684.—A little evergreen tree or usually remaining shrubby, all parts glabrous; leaves often crowded so as to appear verticillate, simple, on very short and thick petioles or almost sessile, broadly or oblong-lanceolate, about 6-12 in. long, tapering towards the cordate or often almost acute base, entire, acuminate, chartaceous, glabrous, glossy above; flowers small, whitish or pinkish white, pedicelled, forming a glabrous terminal panicle about half as long as the leaves; petals cuneate-oblong, blunt, furnished with a single, short, woolly scale; disk conspicuous, crenulate; stamens 6-8; filaments glabrous; ovary 2-lobed-obcordate, with 2 short stigmatic lobes; berries rarely didymous, but usually solitary by abortion, oblong, the size of a bean, smooth, red, 1-seeded.

Hab.—Frequent in the tidal forests of the Andamans, also in those of Pegu and Tenasserim.—SS.=Sal.

ALLOPHYLUS, L.

Flowers polygamous. Sepals 4, broadly imbricate, the 2 outer ones smaller. Petals 4, rarely none. Disk one-sided, usually lobed or divided into 4 glands. Stamens 8, more or less one-sided. Ovary excentrical, 2- or rarely 3-celled, with a solitary ovule in each cell. Fruit consisting usually of one, rarely 2, indehiscent fleshy or dry lobes. Seeds with a small arillus. Cotyledons folded.—Shrubs or trees, with 1-3-foliolate leaves. Flowers very small, in simple or panicled axillary racemes.

* Rachis of inflorescence perfectly glabrous or nearly so; racemes simple . . . . . *A. Cobbe.*

** Rachis of inflorescence more or less pubescent or villous.
Bractlets minute and short; the whole plant pubescent or villous-pubescent . . . . . *A. serratus.*
Bractlets linear, as long or longer than the pedicels; the whole plant rather glabrous, only the nerves above villous . . *A. aporeticus.*

1. **A. Cobbe,** Bl.—(*A. littoralis,* Bl.).—A shrub, all parts glabrous; leaves small, 3-foliolate; leaflets on short petiolules or almost sessile, ovate or ovate-oblong, about 2-3 in. long, rarely longer, cuneate and decurrent at the base, blunt or bluntish acuminate, crenate-toothed, membranous or nearly so, glabrous, except a hair-tuft in the nerve-axils beneath; flowers small, whitish, shortly pedicelled, in small clusters, forming slender, simple, axillary, perfectly glabrous racemes shorter or longer than the leaves; petals cuneate, notched, with a basal scale bearing a tuft of hair above the claw or woolly all over; filaments villous at the base; ovary pubescent, 2-lobed; berries usually solitary, very rarely paired, globular, the size of a pepper-kernel, bright red, 1-seeded.

Hab.—Pegu and Tenasserim; also Chittagong.—Fl. July.

2. **A. serratus,** DC.—A much-branched evergreen little tree, the shoots slightly pubescent, soon glabrescent; leaves 3-foliolate; leaflets ovate to ovate-oblong, shortly petioluled or almost sessile, about 2-4 in. long, acute or acuminate, irregularly and coarsely serrate, sometimes almost entire, while young (especially beneath) pubescent, or glabrous from the beginning and bearing only a hair-tuft in the nerve-axils beneath; flowers small, whitish, shortly pedicelled, in small clusters, forming simple or slightly branched pubescent or puberulous slender axillary racemes of the length of the petioles or longer; petals cuneate, notched, with a basal scale bearing a tuft of wool or villous all over; filaments woolly at the base; ovary pubescent, 2-lobed; berries usually paired, rarely solitary, obovoid or almost globular, the size of a pepper-kernel, smooth, bright red, 1-seeded.

Hab.—Coasts from Chittagong and Arracan down to Tenasserim.

3. **A. aporeticus,** Kz.—A small meagre shrub, usually 2-3 ft. high, the younger parts shortly pubescent; leaves rather large, 3-foliolate, on a slightly pubescent petiole 3-5 in. long; leaflets cuneate-oblong or cuneate-obovate, the lateral ones somewhat unequal, on short thick sparingly pubescent petiolules, shortly acuminate, 6-8 in. long, remotely and irregularly serrate, membranous, glabrous, the nerves more or less pubescent beneath and densely tawny villous above; flowers clustered, small, pale-yellow, on short, slender, glabrous pedicels, supported by linear-subulate hirsute bracts of the length of, or usually longer than, the pedicels themselves; racemes rather robust, recurved, simple, axillary, tawny villous and shorter than the petioles; petals obovate-cuneate, notched, very

woolly inside above the middle; filaments glabrous or woolly at the base; ovary villous; berries usually solitary by abortion, very rarely paired, the size and shape of a large pea, crimson, glossy, 1-seeded.

HAB.—Very frequent in the moister upper mixed forests of Arracan up to 1,200 ft. elevation.—Fl. Fr. Octob.—s.—SS.=SiS.

SABIACEÆ.

Flowers hermaphrodite or polygamously dioecious. Calyx 4-5-parted, imbricate. Petals 4-5, equal or unequal, alternating with, or opposite to, the sepals, imbricate. Stamens 4-5, opposite the petals, inserted at the base of the small disk or on the torus, free or cohering with the petals, usually 2 only perfect, the others reduced to scales, rarely all fertile; anthers didymous, the cells opening by a transverse slit or deciduous hood. Ovary 2-3-celled, with 1 or 2 horizontal or suspended ovules in each cell; styles cohering or the stigmas sessile. Ripe carpels 1-2, drupaceous or dry, indehiscent, compressed-kidney-shaped or almost globular, the endocarp crustaceous or bony, 1-seeded. Albumen none or scanty. Cotyledons much folded; radicle inferior.—Shrubs or trees, rarely climbers, with alternate, simple or pinnate leaves. Stipules none. Flowers usually minute; inflorescence various, usually a panicle.

Stamens 4-5, all perfect; drupes compressed-kidney-shaped; often climbers . . . . . ***Sabia.***
Stamens 5, 2 only perfect and larger, the others reduced to scales; drupes globular; trees or erect shrubs . . . . . ***Meliosma.***

SABIA, Colebr.

Flowers hermaphrodite, rarely polygamous. Calyx 4-5-parted. Petals 4-5, opposite the sepals. Disk annular. Stamens 4-5, inserted at the base of the disk, all fertile; the filaments rather thick. Ovary-lobes 2, rarely 3, almost cohering at their axis, with 2 horizontal ovules in each. Carpels 1-2-seeded, usually compressed-kidney-shaped, drupaceous or dry. Albumen scanty. Cotyledons rather flat.—Scandent shrubs, with simple leaves. Flowers solitary or in cymes or panicles, usually small.

Leaves coriaceous; flowers minute, 2 lin. across . . . . ***S. limonacea.***
Leaves herbaceous; flowers nearly 4 lin. in diameter . . . ***S. viridissima.***

1. **S. limonacea,** Wall.—A large scandent shrub, all parts glabrous; leaves from lanceolate to oblong-lanceolate, rounded or acute at the base, 3-7 in. long, acute or acuminate, coriaceous; flowers minute, yellowish, on about 2 lin. long thick pedicels, forming elongate, reddish, leafy or leafless glabrous usually axillary panicles of the length of the leaves or longer; sepals obsoletely ciliate,

rotundate; petals broadly obovate, blunt, very shortly clawed, about a line long, 5-nerved; stamens finally as long as the petals; drupes compressed, almost rotundate-kidney-shaped, the stone tubercled.

HAB.—Chittagong.

2. **S. viridissima,** Kz.; H.f. Ind. Fl. ii. 3.—A shrub, all parts glabrous; leaves obovate- to elliptically oblong, on a 6-8 lin. long petiole, acuminate at both ends, herbaceous, glabrous, 6-8 in. long; flowers small, white, on about 3 lin. long slender pedicels thickened upwards, forming 1 or 2 lax, glabrous, short panicles in the axils of the leaves; calyx glabrous; the lobes ovate, blunt; petals nearly 2 lin. long; style 3-cleft, the stigmas horse-shoe-shaped.

HAB.—Not unfrequent in the tropical and moister upper mixed forests of the Andamans, especially along the western coasts.—Fl. May.

MELIOSMA, Bl.

Flowers hermaphrodite or polygamously dioecious. Sepals 4-5. Petals as many, very unequal, the 2 inner ones small and sometimes 2-cleft. Stamens 5, inserted outside to the base of the disk, very unequal, the 2 larger ones fertile, the 3 others without anthers. Ovary entire, 2-3-celled, with 2 horizontal or suspended ovules in each cell. Drupe almost obliquely globular, the stone bony or crustaceous, 1- or rarely 2-celled. Cotyledons folded.—Trees or shrubs, with alternate, simple or pinnate leaves. Flowers minute, in thyrsoid panicles.

1. **M. simplicifolia,** Bl.; H.f. Ind. Fl. ii. 5.—A large evergreen tree, 40 to 50 ft. high, all softer parts shortly tawny pubescent; leaves simple, obovate-lanceolate or obovate-oblong, tapering at base on a shortly pubescent petiole $\frac{2}{3}$-1 in. long, 8-10 in. long, shortly acuminate, entire or very remotely serrulate, thin chartaceous, glabrous, except the shortly tawny pubescent nerves beneath while young; flowers minute, white, very shortly pedicelled or almost sessile, racemose, forming terminal and axillary tawny puberulous or almost shortly tomentose panicles; bracts oblong, rusty-pubescent; sepals minutely puberulous; the outer 3 petals oblong, almost crenulate, the 2 inner ones 2-cleft and adnate to the stamen, so as to appear a single one; disk consisting of 3 variously lobed scales arising from the petals and forming a dome over the ovary; fertile stamens 2; drupes almost globular, the size of a small pea, succulent, smooth, black, 1-celled and 1-seeded; seed horse-shoe-shaped, as in *Menispermaceæ*, with a hollow process between.

HAB.—Tropical forests of Tenasserim.—Fl. March-Apr.

REMARKS.—Wood brown, rather light, coarsely fibrous, but rather close-grained; takes a good polish.

ANACARDIACEÆ.

Flowers hermaphrodite or unisexual, usually regular. Calyx 3-7-cleft or -parted, rarely spathaceous or irregularly slit, the sepals sometimes wing-like enlarging, or the tube or base of tube engrossing and turning fleshy. Petals 3-7, rarely none, free or very rarely united with the torus, sometimes enlarging into wings. Disk usually annular, rarely the torus raised and stalk-like. Stamens usually twice as many as petals, usually inserted at the base of the disk, all perfect or variously imperfect; anthers dehiscing inwards. Ovary superior, usually 1-celled, with 1-3 styles, or 2-5-celled, or very rarely of 2 to 5 distinct carpels, with a solitary ovule in each cell, in male flowers reduced to 4 or 5 style-shaped rudiments. Fruit superior or very rarely half-inferior, free or adnate to the engrossed calyx-tube or disk, 1- or rarely several-celled, usually drupaceous and indehiscent. Seed erect, horizontal or pendulous. Albumen none or scanty. Radicle inferior or superior.—Trees or shrubs, rarely climbing, with alternate or rarely opposite, often crowded, simple or compound leaves. Stipules none. Flowers small, variously arranged.

An important order to the forester, the members of which are all woody. They abound in resinous, sometimes acrid, often poisonous principles. The mangoes, cashew nut, hog-plums, and pistacia nut are edible. Varnish is the produce of several members of this family. The bark of many is good for tanning; the timber, however, is inferior.

* *Ovary 1-celled; drupes 1-seeded.*

× *Leaves simple.*

○ Calyx and petals remaining unchanged after flowering.

\+ Calyx 3-5-parted or -toothed.

Stamens 1-5, 1 or 2 bearing anthers; style filiform; leaves alternate . . . . . *Mangifera.*

Stamens 3-8, all anther-bearing; style short; leaves opposite . *Bouea.*

Stamens 10; carpels 5-6; style short . . . . . *Buchanania.*

\+\+ Calyx spathaceous; stamens inserted on the stalk-like torus . . . . . *Gluta.*

○○ Calyx-tube or its base engrossing, or either the sepals or the petals wing-like enlarging.

\+ Calyx-tube or its base engrossing; sepals and petals remaining unchanged.

† Nut superior, seated on the much-engrossed fleshy calyx-base.

Stamens 8-10; torus stalk-like; style 1, filiform . . . . . *Anacardium.*

Stamens 5; disk annular, rather broad; styles 3 . . . . . *Semecarpus.*

†† Fruit inferior, enclosed in the enlarged calyx-tube.

Petals valvate; styles 3 . . . . . *Holigarna.*

Petals imbricate; style 1 . . . . . *Drimycarpus.*

\+\+ Petals wing-like enlarging, the calyx-tube and sepals unchanged or nearly so.

Stamens 5; drupe sessile . . . . . *Swintonia.*
Stamens numerous; drupe stalked . . . . . *Melanorrhoea.*
× × *Leaves pinnate to 3-foliolate.*
○ Calyx-lobes wing-like enlarging; leaves pinnate . *Parishia.*
○ ○ Calyx remaining unchanged; petals imbricate.
+ Styles 3-4 in the female or hermaphrodite flowers.
Erect trees or shrubs; ovule suspended from a free, erect, basilar funicle . . . . . *Rhus.*
Trees; ovule suspended near the summit of the cavity . . . *Odina.*
+ + Style 1; ovule suspended; climber . . *Tapiria.*
∗ ∗ *Ovary 2-5-celled; ovules pendulous; leaves pinnate.*
Flowers polygamous; styles 4 or 5, free at the summit . . . *Spondias.*
Flowers hermaphrodite; styles 5, thick, connate at the top and resembling ovaries . . . . . *Dracontomelum.*

MANGIFERA, L.

Flowers polygamously dioecious. Calyx 4- or 5-parted, deciduous, imbricate. Petals 4 or 5, the nerve usually thickened at the middle, imbricate. Disk cushion- or stalk-like, lobed. Stamens 1 or 4-5, of which 1 or 2 are fertile. Ovary free, 1-celled, with a single ascending ovule; style lateral, filiform. Drupe almost kidney-shaped or ovoid, fleshy, the putamen fibrous-woody, 1-seeded; radicle inferior.—Trees, with alternate simple leaves. Flowers usually small, panicled.

∗ *Petals and stamens free, the former inserted at the base of the cushion-like or cup-shaped disk.*
× Pedicels 3-6 lin. long, very slender . . . *M. longipes.*
× × Pedicels very short and thick; fertile stamen 1.
Panicle and calyx glabrous; petals about 3 lin. long; disk cup-shaped; drupes 2-3 in. long, acuminate; net-veination very lax and thin . . . . . *M. sylvatica.*
Panicle and calyx more or less puberulous; petals hardly 2 lin. long; disk 5-lobed; drupes 3-4 in. long, blunt; net-veination lax and thin . . . . . *M. Indica.*
Panicle and calyx densely pubescent; petals hardly 2 lin. long; disk 5-lobed; drupes 1-2 in. long, blunt; net-veination minute and elegant, strongly prominent on both surfaces . *M. caloneura.*
∗ ∗ *Petals and stamens united with the base of the stalk-like torus, or rarely the latter wanting;* leaves almost polished beneath . . . . . *M. fœtida.*

1. **M. longipes,** Griff.; H.f. Ind. Fl. ii. 15.—*Thayet-thee-nee.*—An evergreen tree (50—60 + 15—30 + 4—6), all parts glabrous; leaves lanceolate or elliptically lanceolate, on a 1-2 in. long petiole thickened at the base, acuminate, 5-6 in. long, waved along the borders, coriaceous, beneath opaque and almost glaucescent, the lateral nerves copious and almost as thin as the copious conspicuous net-veination; flowers dioecious, small, whitish with yellow centre, on slender 3-6 lin. long puberulous pedicels, usually cymulose or racemulose, forming a slender puberulous lax terminal panicle peduncled or branched already from the base; bracts linear-subu-

late, ciliate; calyx 5-cleft to near the base, the lobes narrow-linear, acuminate, ½ lin. long, puberulous outside; petals linear-lanceolate, twice as long as the calyx-lobes, subulate-acuminate, reflexed from the middle, traversed by 5 yellow raised veins; stamens 2-3, one only fertile; the filament slender, inserted to the inner margin of the conical 5-lobed disk.

Hab.—Frequent in the swamp forests of the Pegu plains; also in Tenasserim.—Fl. Dec.-Jan.—s.—SS.=All.

2. **M. sylvatica,** Roxb.; H.f. Ind. Fl. ii. 15.—*Hseng-neng-thayet.*—A large evergreen tree, 60 to 80 ft. high, all parts quite glabrous; bark grey, about 2 in. thick, more or less irregularly cracked, otherwise rather smooth; leaves lanceolate to oblong-lanceolate, on a long petiole thickened at the base, acuminate, entire, chartaceous or almost coriaceous, glabrous, usually rather opaque on both sides, the nerves much more curved than in the following species, copiously but laxly net-veined between; flower rather small, white, shortly pedicelled, forming an ample terminal rather slenderly branched glabrous panicle longer than the leaves; calyx glabrous, the lobes nearly a line long; petals linear, rather acute and twisted, about 3-4 times longer than the calyx-lobes; disk annular, villous, slightly grooved and united with the torus; stamen 1, fertile, inserted inside the disk; drupes ovate, obliquely acuminate, nearly as large as the common mango, much compressed, fleshy, smooth, when ripe yellow, containing a woody-fibrous large putamen.

Hab.—Rare in the tropical forests of the Martaban hills.

3. **M. Indica,** L.; H.f. Ind. Fl. ii. 13; Bedd. Sylv. Madr. t. 162; Brand. For. Fl. 125.—*Thayet.*—An evergreen tree (40—60 + 15—30 + 4—8), all parts glabrous; leaves crowded towards the end of the branchlets, elliptically-oblong to oblong-lanceolate, on a rather long petiole, about 6-10 in. long, acuminate to almost blunt, often waved along the borders, coriaceous, glossy above, the nerves strong, net-veination copious and conspicuous, but lax; flowers small, on very short thick pedicels, yellowish with reddish streaks, forming a large puberulous terminal panicle branched already from the base and in length much exceeding the leaves; calyx densely puberulous, the lobes about a lin. long; petals twice as long as the calyx-lobes; disk 5-lobed, glabrous, the lobes fleshy, as large as the ovary, greenish or yellow, bearing usually 2-4 rudimentary very small anthers; fertile stamen 1, very rarely 2; drupes ovoid or oblong-kidney-shaped, the size of a goose's egg, or smaller or larger, slightly compressed in the cultivated, much so in the wild form, fleshy, sappy, smooth, green-yellow to reddish, containing a large fibrous-woody 1-celled putamen.

Hab.—Not unfrequent in the tropical and lower mixed forests all over Burma from Arracan and Pegu down to Tenasserim and the Andamans; also generally cultivated all over the country.—Fl. Feb.-March; Fr. May-July.—l×s.—SS.=∞.

Remarks.—Wood yellowish or dull-grey, coarsely fibrous, rather loose-grained, light; soon decays if exposed to wet. Heart-wood about 3-4 in. across, close-grained and much more durable, but takes only an indifferent polish. Used occasionally for cabinet-work, for house- and coach-building purposes, and for packing-cases. Exudes a yellowish gum.

4. **M. caloneura,** Kz.; H.f. Ind. Fl. ii. 14.—An evergreen tree (40—60+15—25+4—6), all parts glabrous; leaves oblong to oblong-lanceolate, 3-5 in. long, on an almost marginate petiole 1 to ½ in. long, bluntish acuminate, coriaceous, glabrous, minutely and elegantly net-veined between the thin lateral nerves, the mid-rib broad and on both sides prominent; flowers small, sessile or nearly so, forming a large terminal tomentose panicle longer or shorter than the leaves; calyx pubescent; petals lanceolate, acute, reflexed, about a line long, ciliolate, white, traversed by a citroon-yellow longitudinal line; stamen 1, fertile, the anther purple; disk 5-lobed, smooth; drupes ovoid-kidney-shaped, the size of a hen's egg, smooth, blunt, orange-yellow or yellow, acid-sweet, almost terete, containing a large thin-wooded 1-seeded putamen.

Hab.—Frequent in the low and lower mixed forests of the eastern and southern slopes of the Pegu Yomah.—Fl. Dec.-Jan.; Fr. May.—s.×l.—SS. =*Lat. p.* Dil. All.

5. **M. fœtida,** Lour.; H.f. Ind. Fl. ii. 18.—*La-mote.*—A large evergreen tree, all parts quite glabrous; leaves oblong- to elliptically-lanceolate, on a robust 1-2 in. long petiole thickened at the base, shortly acuminate or apiculate, firmly coriaceous, 6-10 in. long, glabrous, glossy and almost polished beneath, the nerves very strong but blunt, the net-veination obsolete; flowers small, on 1-2 lin. long thick pedicels, forming a reddish, robust, glabrous, terminal panicle as long or longer than the leaves; calyx glabrous, the lobes oblong, blunt, 2 lin. long; petals twice as long, linear, acute; stamens 5, at the base united with the short torus, all but 1 or occasionally 2 sterile; drupes ovoid-oblong, very large, of a dull yellowish grey, smooth and a little pruinous, rather blunt, strongly smelling, containing a large, woody, fibrous, 1-seeded putamen.

Hab.—Southern Tenasserim, cultivated.

BOUEA, Meisn.

Flowers polygamous. Calyx short, 3-5-parted, the lobes valvate. Petals 3-5, imbricate. Disk very short. Stamens 3-8, inserted on the disk, all fertile. Ovary free, sessile, with a solitary ascending

ovule; style short, terminal. Drupe fleshy, the putamen thin, woody, fibrous, indehiscent, 1-seeded. Seed nearly erect; radicle inferior.—Trees, with opposite, simple leaves. Flowers small, in terminal or axillary panicles.

Panicle small, sessile or nearly so, quite glabrous; petals ½ lin. long. *B. oppositifolia.*
Panicle large, long-peduncled, puberulous; petals a lin. long or longer . . . . . *B. Burmanica.*

1. **B. oppositifolia,** Meisn.—*Mayan.*—An evergreen tree (40—50+20—25+4—6), all parts glabrous; bark dark-grey, narrowly fissured; leaves more or less lanceolate, on a rather long petiole, long and bluntish acuminate, 4-5 in. long, coriaceous, glabrous, glossy beneath, the nerves impressed beneath; flowers small, on 1-1½ lin. long pedicels, pale yellow or greenish white, forming a small terminal glabrous almost sessile thyrsoid panicle shorter than the leaves; calyx slightly puberulous, 4-5-toothed, the teeth oblong, acute; petals 4 or 5, about ½ a lin. long, lineal-oblong, blunt; stamens 5, all fertile; filaments short, broad at the base; drupes ovoid-oblong and somewhat kidney-shaped, the size of a small pullet's egg, somewhat compressed, smooth, yellow (or bluish-black) sappy, acid or sweet, containing a thin, woody, 1-seeded putamen.

Hab.—Rather rare in the tropical forests of Martaban and Tenasserim, frequent in those of the Andamans; also generally cultivated all over Burma.—Fl. Jan.-Febr.; Fr. Apr.-May.—s.—SS.=*Metam.* SiS.

Remarks.—Sap-wood greyish, very coarsely fibrous and loose-grained; heart-wood large, blackish or reddish, ebony-like, hard, close-grained, rather heavy.

2. **B. Burmanica,** Griff.—An evergreen tree, the very young shoots minutely puberulous; leaves lanceolate or elliptically lanceolate, on a longer or shorter glabrous petiole, longer or shorter bluntish acuminate, coriaceous, glabrous, in a dried state opaque, the lateral nerves impressed on both sides, the midrib and petiole of the very young leaves minutely puberulous; panicles large, on a 2-4 in. long peduncle, terminal, puberulous, partially more or less glabrescent; flowers larger than in the preceding, on a slender 3 lin. long puberulous pedicel, racemulose; calyx minute, puberulous, truncately toothed; petals obovate-oblong, somewhat acute, more than a line long; stamens usually 8, all fertile, the filaments short and filiform, a little puberulous; drupes ovoid-reniform, the size of a small pullet's egg, smooth, fleshy, acid, purplish black (?), containing a thin, woody, 1-seeded putamen.

Hab.—Tenasserim, in Thoung-gyeen.—Fl. March.

BUCHANANIA, Roxb.

Flowers hermaphrodite. Calyx short, 3-5-toothed, persistent,

imbricate. Petals 5, imbricate. Disk orbicular, 5-crenate. Stamens 10, inserted to the base of the disk, free. Ovary-carpels 5-6, distinct, inserted on the concave summit of the disk, of these but one fertile with a solitary ovule suspended from a free basilar funicle. Drupe small, containing a bony or crustaceous 2-valved putamen. Radicle superior.—Trees, with alternate simple leaves. Flowers small, in terminal and axillary panicles.

* *Leaves and panicles more or less tomentose or pubescent.*
○ Leaves on both sides tomentose or pubescent, large.
Panicles stout and stiff; flowers 2 lin. in diameter, sessile and crowded . . . . . *B. latifolia.*
Panicles slender, grey-pubescent; flowers hardly a line across, pedicelled and lax . . . . . *B. laxiflora.*
○○ Leaves small, puberulous beneath, glossy above, retuse, the petiole 1-2 lin. long . . . . *B. Siamensis.*
** *Leaves glabrous and more or less glossy, usually fuscescent in drying; panicles glabrous or puberulous.*
○ Panicles rusty-puberulous . . . . . *B. glabra.*
○○ Panicles, etc., quite glabrous; flowers pedicelled.
Leaves equally decurrent at the base; pedicels very slender; petals a line long, reflexed; panicles longer than the leaves . . *B. arborescens.*
Leaves equally decurrent at the base; pedicels short and stout; petals ¾ lin. long, erect; panicles as long or longer than the leaves . . . . . *B. acuminata.*
Leaves very unequally decurrent at the base, large; pedicels very slender; petals a line long, reflexed; panicles crowded, shorter than the leaves . . . . . *B. lancifolia.*

1. **B. latifolia,** Roxb.; H.f. Ind. Fl. ii. 23; Bedd. Sylv. Madr. t. 145; Brand. For. Fl. 127.—*Lambo* or *Lone-hpo.*—A tree (30—40+20—25+3—6), shedding leaves in H.S., the younger parts more or less villous-pubescent; leaves oblong to elliptically oblong, on a short, thick, flattened petiole, about 6-7 in. long, blunt, entire, coriaceous, while young villous-tomentose beneath and a little pubescent above, afterwards glabrous above and beneath, shortly tomentose especially on the strong irregular nerves and net-veination; flowers small, whitish, on short and thick pubescent pedicels or almost sessile, clustered-racemose, forming several dense-branched tomentose panicles at the end of the branchlets; calyx sparingly stiff-hairy; petals oblong, acute, about a line long; filaments slender, glabrous; disk yellow, deeply 10-crenate; ovary-carpels hispid-pubescent, only one of them fertile; drupes almost ovoid-reniform, the size of a small cherry, slightly compressed, smooth, purplish black, containing a very hard 1-seeded putamen.

Hab.—Common in the open and dry forests, especially the Eng forests, all over Burma from Ava and Martaban down to Tenasserim.—Fl. March; Fr. Apr.—l.—SS. = *Lat.* Dil. Metam. CaS.

Remarks.—Wood light and soft, rather tough, but not used. Said to give good charcoal. □′ = 36 pd.

2. **B. laxiflora,** Kz.; H.f. Ind. Fl. ii. 24.—A deciduous tree,

all the younger parts greyish tomentose; leaves ovate-oblong, obtuse at the base, about 6-7 in. long, on a strong petiole ½ an in. long, coriaceous, entire, shortly tomentose, glabrescent above; flowers minute, on short but slender pedicels, forming a lax spreading much-branched greyish or tawny pubescent panicle at the end of the branches; bracts small, subulate; calyx greyish puberulous; the lobes oblong, acute, hardly ¼ lin. long; petals obovate-oblong, hardly a line long; filaments slightly puberulous; ovary-carpels glabrous.

Hab.—Martaban, and Pegu above Rangoon.—Fl. Jan.-Febr.—SS.=Ca. Lat. (?).

3. **B. Siamensis,** Miq.—An evergreen tree, the young branchlets brown pubescent; leaves small, obovate to elliptical, rounded or acute at the base, on a very short stout pubescent petiole, more or less retuse or rounded at the apex, 1-2 in. long, firmly coriaceous, glossy dark-green above, beneath minutely puberulous and more or less glabrescent, the margins usually recurved; fruiting racemes about twice as long as the leaves, puberulous, axillary; drupes on stout peduncles about a line long, the size of a very large pea, almost obcordate-ovoid, slightly compressed, glabrous.

Hab.—Adjoining Siamese province of Radbooree.—Fr. H.S.

4. **B. glabra,** Wall; H.f. Ind. Fl. ii. 23.—A tree; leaves broadly elliptical or oblong to almost orbicular, rounded at the base, on a short petiole ½ in. long, blunt or rounded at the apex, very coriaceous, the upper-side raised between the nerves, the under-side strongly nerved and net-veined, shining; flowers about a line in diameter, very shortly pedicelled, rather crowded, forming a spreading rusty puberulous glabrescent panicle shorter than the leaves; unripe fruit glabrous.—(After Hooker.)

Hab.—Upper Tenasserim.

5. **B. arborescens,** Bl. (*B. lucida,* Bl.; H.f. Ind. Fl. ii. 24).—An evergreen tree, all parts glabrous; leaves obovate to obovate-oblong, acuminate at the base and narrowed into the 1-2 in. long petiole, rounded or blunt, 4-7 in. long, coriaceous, fuscous-brown and glossy, net-veined on both sides; flowers about 1½ lin. across, white, slenderly pedicelled, lax, forming glabrous lax panicles usually longer than the leaves; sepals orbicular; petals elliptical, blunt, a line long, reflexed; drupes globose, compressed, glabrous, the size of a large pea.

Hab.—Tenasserim.

6. **B. acuminata,** Turcz.—A small evergreen tree, all parts glabrous; leaves obovate to obversely lanceolate, on a slender petiole varying much in length and up to 1 in. long, acuminate at both

ends, thin-coriaceous, glabrous and glossy, red-brown in drying, net-veined on both sides; flowers small, white, a little more than 2 lin. in diameter, on short and stout pedicels, forming glabrous lax panicles usually longer than the leaves; sepals small, orbicular; petals ¾ lin. long, erect and straight, oblong; drupes compressed orbicular, glabrous.

Hab.—Forests of the Andamans and of Tenasserim.

7. **B. lancifolia,** Roxb.; H.f. Ind. Fl. ii. 24.—A large evergreen tree, the young shoots tawny villous; leaves lanceolate or oblong-lanceolate, on a glabrous petiole 1-1½ in. long, tapering at the base, 7-8 in. long, bluntish acuminate, entire, coriaceous, quite glabrous, the nerves conspicuous, the net-veination irregular; flowers small, white, on 2-3 lin. long glabrous pedicels, laxly cymulose, forming usually numerous white-branched, glabrous, lax, and rather slender panicles at the end of the branchlets; calyx glabrous; petals ovate-oblong, rather blunt, about 2 lin. long; filaments as long as the ovary, glabrous; ovary-carpels quite glabrous; drupes the size of a large pea, somewhat compressed, obliquely oblong.

Hab.—From Chittagong and Arracan down to the Andamans, in tropical forests.—Fl. C.S.

GLUTA, L.

Flowers hermaphrodite. Calyx spathaceous, splitting irregularly, caducous. Petals 5 (rarely 4 or 6), adhering to the base of the raised stalk-like torus, imbricate. Stamens 4-6, inserted above the petals on the torus; filaments capillary, free. Ovary stalked, oblique, 1-celled, with a solitary ovule suspended from a free basilar funicle; style filiform, lateral. Berry stalked, deformed, with a thick rind. Testa connate with the endocarp and abounding in a black balsamous juice.—Trees, with alternate simple leaves, the juice caustic. Flowers small, in axillary and terminal panicles.

Panicle, calyx, and leaf-buds shortly puberulous; petiole thick, often short . . . . . *G. Tavoyana.*
All the above parts glabrous; petioles long and slender . . . *G. elegans.*

1. **G. Tavoyana,** H.f. Ind. Fl. ii. 22.—*Thayet-thitsay.*—An evergreen small tree, the very young shoots minutely and densely puberulous; leaves elliptically to linear-oblong, acute at the base, or almost decurrent on the long, strong petiole, bluntish acuminate or apiculate, rarely blunt, coriaceous or nearly so, 6-9 in. long, glabrous, the nerves and net-veination on both sides conspicuous; flowers middling-sized, yellowish, on 2-4 lin. long, slender, puberulous pedicels, forming short almost simple or branched axillary and terminal

puberulous panicles usually much shorter than the leaves; calyx about 2 lin. long, cylindrically spathaceous and irregularly splitting, puberous; petals linear-spathulate, nearly twice as long as the calyx; stamens 4, exserted, the filaments glabrous, filiform, up to the middle adnate to the stalk-like torus; berries drupe-like, much deformed-globose and depressed, roughish.

Hab.—Coasts of Tenasserim from Tavoy southwards.—Fl. Nov.

2. **G. elegans,** Kz.; H.f. Ind. Fl. ii. 22.—A small evergreen tree, all parts glabrous; leaves lanceolate to oblong-lanceolate, tapering at the base, on a slender 1-2 in. long petiole, shortly and bluntish acuminate, thin coriaceous, glabrous, the nerves and net-veination conspicuous on both sides; flowers rather small, white, on 3-6 lin. long rather thick or slender glabrous pedicels, forming rather small, slender, glabrous corymbose panicles at the end of the branchlets or in the axils of the upper leaves; calyx about 3-4 lin. long, spathaceous, scarlet, veined, glabrous; petals 4 or 5, twice the length of the calyx, linear-lanceolate, bluntish; stamens 4 or 5; the filaments slender and united at the base with the petals and the torus.

Hab.—Tenasserim, along the coasts.

Remarks.—Wood good for furniture, and when steeped in ferruginous mud turns je. black, looking like ebony. Used also for building purposes, boxes, &c., and for dyeing (with different mordants, from orange to black).

N. B.—**G. longipetiolata,** Kz.—An evergreen small tree (25—30+10—15+3—4) of the coast-forests of the Andamans, has the leaves about half a foot long or longer, the petioles stronger, up to 2 in. long. Flowers and fruits still unknown.

ANACARDIUM, Rottb.

Flowers polygamous. Calyx 5-parted, deciduous, erect. Petals 5, imbricate. Torus stalk-like, filling up the base of the calyx. Stamens 8-10, unequal, all or some of them fertile, the base of the filaments united with the torus. Ovary free, sessile, with a solitary ovule ascending from a very short funicle; style excentrical, filiform. Nut kidney-shaped, supported by the very large pear-shaped hypocarp (the engrossed torus and calyx-base), indehiscent, the pericarp thick, cellular, oily.—Trees or shrubs, with alternate simple leaves. Flowers rather small, in terminal bracted corymbose panicles.

1. **A. occidentale,** L.; H.f. Ind. Fl. ii. 20; Bedd. Sylv. Madr., t. 163.—*Thee-hoh-thayet.*—An evergreen (25—30+8—15+2—3), all parts glabrous; bark rough and cracked; leaves obovate to obovate-oblong, on a short, thick and broad petiole, rounded or bluntish at the base, 5-7 in. long, blunt or almost repand, entire, coriaceous,

glabrous, the nerves and net-veination conspicuous on both sides; flowers small, on 1½-2 lin. long minutely puberulous pedicels, forming bracted terminal branched more or less minutely greyish puberulous panicles; bracts lanceolate, puberulous; calyx 5-cleft to near the base; petals linear-lanceolate, revolute, pale-yellowish with pink streaks, 6-7 lin. long; stamens usually 9 or 10, one of them much longer; nut kidney-shaped, blunt, the size of a plum, compressed, seated on a fleshy glabrous orange-coloured edible hypocarp of the size and shape of a small pear.

Hab.—In the beach forests and along sandy sea-shores and dunes of Chittagong and Tenasserim. Also cultivated in villages.—Fl. Nov.-Decb.—l.—SS.= Aren. Ca.

Remarks.—Wood dark-brown, excellent for charcoal. Exudes an astringent pellucid gum like gum-arabic, forming a good varnish. The juice issuing from incisions in the bark yields an indelible marking ink. The pericarp of the nuts produces a black acrid oil (cardole or cashew apple-oil), while the seeds themselves yield a very good edible oil.

SEMECARPUS, L.f.

Flowers polygamous. Calyx 5-cleft, the lobes deciduous, imbricate. Petals 5, valvate or imbricate. Stamens 5, inserted to the base of the annular rather broad disk. Ovary superior, sessile, with a solitary ovule suspended from the summit of the cavity; styles 3, terminal. Nut kidney-shaped, seated on the very thick cup-shaped or turbinate hypocarp (engrossed base of the calyx); the pericarp thick, hard, cellular and resinous. Seed pendulous. Radicle superior.—Trees, with alternate simple leaves. Flowers small, in terminal or lateral bracted panicles.

* *Nut much exserted from the fleshy hypocarp. Ovary quite superior.*

× Ovary tomentose or pubescent.

\+ Hypocarp (enlarged fleshy base of calyx) as large or nearly as large as the nut.

Leaves coriaceous, blunt, densely pubescent or tomentose and strongly net-veined beneath; nut not or almost not oblique . *S. Anacardium.*

Leaves (full grown) chartaceous, sharply acuminate, softly pubescent beneath, the net-veination faint; nut very oblique . *S. panduratus.*

\+ \+ Hypocarp very small.

Leaves coriaceous, acuminate, quite glabrous or pubescent and very glaucous beneath, the net-veination strong; nut very oblique, 1½-1 in. across . . . . . *S. heterophyllus.*

× × Ovary quite glabrous.

A tree; leaves chartaceous, acuminate, glabrous; panicles quite glabrous; nut an in. broad. *S. subpanduriformis.*

A simple-stemmed shrub with a large subterranean trunk; panicles densely puberulous; nut only 3-4 lin. long . . . . *S. subracemosus.*

* * *Nut adnate to the hypocarp, free only at the very apex. Ovary superior.*

Leaves glabrous, or pubescent and whitish beneath; nut velvety, barely exserted from the sappy veined puberulous hypocarp . *S. albescens.*

1. **S. Anacardium,** L.f.; Bedd. Sylv. Madr. t. 146; Brand. For. Fl. 124.—A leaf-shedding tree, 30-40 ft. high, all the younger parts shortly tomentose or densely puberulous; leaves crowded at the end of the branches, obovate or oblong (those of the shoots or young trees not seldom elongate and cuneate-obovate with a short point), rounded or obtuse at the base, on a strong 1-2 in. long densely puberulous petiole, ½ to 1½ ft. long, blunt or mucronate, entire, harshly coriaceous, glabrescent above, the under-surface covered with a thin grey velvety tomentum, the net-veination very coarse and prominent; flowers small, dull greenish yellow, the female ones on 1-3 lin. long very thick tomentose pedicels, racemulose and nearly twice larger than the clustered almost sessile male ones, both forming a terminal, ample and robust, tomentose panicle of the length of the leaves or shorter; males: petals about a line long, oblong-lanceolate; stamens 5, the filaments slender; ovary reduced to a tuft of hairs; females and hermaphrodites: petals about 2 lin. long; stamens often incomplete; ovary densely appressed tawny hispid; styles 3; nuts about an in. long, about as long as broad, smooth, black, shining, almost broadly oval and somewhat compressed, notched-obtuse at the top, the hypocarp turbinate, fleshy, yellow, smooth, nearly as large and thick as the nut itself.

Hab.—Chittagong. Said to occur also in Burma.—Fl. H.S.; Fr. C.S.—l.

Remarks.—Wood grey or reddish white, soft and useless. Nuts used as a mordant, and for making an indelible marking-ink. Yields a bright gum.

2. **S. panduratus,** Kz.—*Chyay-pen.*—A tree (50—60+20—30+4—6), leafless during H.S., all younger parts pubescent or shortly pilose; bark about 1-1¼ in. thick, rather smooth, ash-grey; cut red; leaves large, 1-1½ ft. long, cuneate-obovate, acute or obtuse at the narrowed base, on a 1-2 in. long puberulous petiole, shortly acuminate or apiculate, entire, almost chartaceous, above (except the puberulous midrib) glabrous, beneath softly and shortly pubescent, the net-veination thin and lax; flowers unknown; nuts very obliquely oblong, longer than broad, produced in a short, oblique, bluntish point, glossy, the hypocarp obversely conical, fleshy, smaller than the nut itself.

Hab.—Frequent in the upper mixed forests all over Pegu and Martaban, up to 2,000 ft. elevation.—Fr. C.S.—l.—SS.=*SiS.*, Metam.

Remarks.—Wood white, turning pale-brown, rather light, coarsely fibrous and rather close-grained, soft, useless, and soon attacked by xylophages. Yields a black resin, and the nuts yield an indelible ink.

3. **S. heterophyllus,** Bl.—An evergreen tree (30—40+8—15+4—5), the branches stout and puberulous while young; leaves elongate-oblanceolate to oblanceolate-oblong, acute at the base, on a

thick petiole up to ½ in. long, 8-12 in. long (in saplings up to 2½ ft. long and of thinner texture), shortly and abruptly acuminate, coriaceous, glabrous, or puberulous on the whitish under-surface, the nerves and net-veination strongly prominent; flowers largish, on velvety stout pedicels not exceeding a line in length, forming stout tawny-velvety terminal panicles; calyx tawny-velvety, the lobes triangular; petals ovate-lanceolate, acute, nearly 2 lin. long, glabrous; ovary densely tawny tomentose; nut very obliquely oval, somewhat longer than broad, up to 1½ in. long, glabrous and glossy, the hypocarp comparatively small, usually glabrous or glabrescent.

Hab.—Rare in the beach forests of the Andamans.—Fr. March-Apr.

4. **S. subpanduriformis,** Wall.; H.f. Ind. Fl. ii. 35.—A leaf-shedding tree (40—60+20—30+4—6), all parts quite glabrous; leaves cuneate-obovate to cuneate-oblong, obtuse or acuminate at the narrowed base, ½-1 ft. long, on a 1-2 in. long petiole, acuminate, entire, almost chartaceous, glabrous, glaucous beneath, the nerves and net-veination thin but sharply prominent; flowers greenish, small, on 1-2 lin. long glabrous and slender pedicels, racemulose, forming a terminal much-branched slender quite glabrous panicle shorter than the leaves; calyx-teeth broad and acute; petals more than a lin. long, ovate-lanceolate, acuminate, disk tawny or yellowish hispid; ovary quite glabrous; styles 3, 2-cleft at the apex; stamens 5, the filaments slender.

Hab.—Frequent in the moister upper mixed forests of Arracan; also in Chittagong.—Fr. Octob.—l.—SS.=SiS.

5. **S. subracemosus,** Kz.—A simple-stemmed shrub, 2-3 ft. high, with a woody subterranean trunk, the shoots tawny puberulous; leaves distant, oblong to obovate-cuneate, somewhat decurrent on the broad ½ to 1 in. long glabrous petiole, blunt or acute, about 3-4 in. to a foot long, entire, thin chartaceous, glabrous and shining above, while young minutely puberulous beneath, sea-green, the lateral parallel nerves and lax net-veination conspicuous; flowers small, greenish white, on very short densely puberulous pedicels, clustered-cymulose, forming very slender tawny puberulous or almost pubescent narrow raceme-like panicles in the axils of the leaves and often collected in branched panicles at the end of the branches; calyx puberulous; petals about a line long, valvate; stamens 5, all fertile, the filaments capillary; disk shortly hispid-tomentose; ovary glabrous, with 3 thick styles, the stigmas almost capitate; nuts small, ovoid-kidney-shaped, black, only 3-4 lin. long, the engrossed fleshy hypocarp nearly as large, yellow.

Hab.—Prome District.—Fl. H.S.

6. **S. albescens,** Kz. (*Holigarna albicans,* H.f. Ind. Fl. ii.

38).—An evergreen tree (50—60 + 25—30 + 4—6), glabrous, or the branchlets and younger parts all velvety pubescent; leaves elongate-obovate to cuneate-lanceolate and almost oblong, on a strong tomentose or glabrous petiole ½-1 in. long, 7-12 in. long, shortly and bluntish acuminate, rounded or obtuse at the narrowed base, entire, coriaceous, above glossy, glabrous, or the midrib above minutely pubescent, and beneath covered with a thin, white, velvety tomentum intermixed with short, soft hairs, the nerves and lax net-veination conspicuous and yellowish; flowers small, on hardly a line long densely pubescent pedicels, racemulose, forming a terminal densely tawny-velvety panicle usually shorter than the leaves; calyx minute, pubescent; petals valvate or nearly so, about a line long, shortly pubescent; ovary densely appressed hirsute, with 3 thick glabrous stigmas; disk narrow, glabrous; stamens 5, usually 1 or 2 of them abortive and longer than the others; filaments short and broad. Ovary densely tawny-hispid; nuts oblique, broader than long, only the top exserted from the fleshy yellowish orange-veined minutely puberulous edible hypocarp.

Var. 1, ALBESCENS PROPER; leaves puberulous beneath.

Var. 2, GLABER; all parts, also the leaves beneath, glabrous.

HAB.—Not unfrequent in the tropical forests of Martaban down to Tenasserim; rather rare in those of the Pegu Yomah, up to 3,000 ft. elevation.—Fl. Jan.-Febr.; Fr. March-Apr.—s.—SS.=*Metam.* SiS.

REMARKS.—Exudes a black varnish.

DRIMYCARPUS, H.f.

Flowers polygamous; calyx 5-lobed, imbricate; petals 5, free, imbricate. Stamens 5, inserted at the base of the annular rather broad disk. Ovary inferior, with a solitary ovule attached to the wall of the cell; style 1, very short. Berry inferior, fibrous-fleshy, resinous, the endocarp coriaceous, 1-seeded.—Trees, with alternate simple leaves, the petiole without glands or stipules. Flowers small, in racemes or panicles.

1. **D. racemosus,** Bth. & H.f. Ind. Fl. ii. 36.—An evergreen tree, all parts glabrous; leaves oblong- to linear-lanceolate, acute at the base, on a thick ½ an in. long petiole, finely but shortly acuminate, more or less waved, coriaceous, 4-8 in. long, quite glabrous, more or less glaucescent beneath, the nerves and net-veination prominent and conspicuous; flowers white, small, the male ones clustered, the hermaphrodite ones on slender puberulous pedicels and racemulose, both forming axillary, short, tawny-pubescent panicles branched already from the base; calyx 5-cleft, the lobes oblong-lanceolate, acute; petals ovate; stamens 5, the filaments short; berry drupe-

like, obliquely and transversely oval, the size of a large cherry, 1-seeded, when ripe red, acrid-juicy and fibrous-fleshy.

Hab.—Rather rare in the tropical forests of the Pegu Yomah, especially along the eastern slopes; also Chittagong.—Fl. Febr.-March; Fr. June-July.—s.—SS.=SiS.

HOLIGARNA, Ham.

Flowers polygamous. Calyx 5-toothed, imbricate; petals 5, slightly cohering at the base and with the filaments, valvate; stamens 5, inserted at the base of the annular rather broad disk. Ovary inferior, with a solitary ovule suspended from the summit of the cavity; styles 3, terminal. Nut drupe-like, inferior, somewhat compressed, resinous-fleshy, the putamen coriaceous.—Trees, with alternate simple leaves, the petiole furnished with glands or barb-like stipules above the middle. Flowers small, in axillary and terminal racemes or panicles.

Leaves glabrous, gradually acuminate; nut entirely enclosed in the calyx . . . . . *H. longifolia.*
Leaves softly pubescent or puberulous beneath, cuspidate; apex of nut exposed, resembling a convex disk . . . . *H. Helferi.*

1. **H. Helferi,** Hook. f. Ind. ii. 37. (*Semecarpus Grahamii,* Kz.; *H. longifolia,* H. f. Ind. Fl. ii. 37, not of Roxb.).—An evergreen tree (30—50+15—30+3—5), the young parts all pubescent; leaves elongate obovate-lanceolate, 1-2½ ft. long, narrowed towards the acuminate base, on a ½-1 in. long strong petiole, furnished at both sides with a pair of barb-like appendages, shortly acuminate, entire, coriaceous, while young softly pubescent beneath, turning glaucous and obsoletely puberulous, glabrous above, the nervature as in *S. longifolia;* flowers small, almost sessile, densely rusty-tomentose, forming a densely rusty-tomentose rather short elongating panicle in the axils of the upper leaves; bractlets linear, glabrous inside, deciduous; calyx-lobes lanceolate, on both sides (inside less) rusty pubescent; pedicels very short, but elongating in fruit to more than ½ an in. and becoming straight and strong; nut elliptically obovate, 1-seeded, only the upper part exposed and forming a broad convex disk nearly 2 lin. across at the top of the engrossed glabrescent not fleshy calyx and encircled with the rusty-tomentose remnants of the calyx-limb.

Hab.—Frequent in the tropical forests of Martaban and of the Pegu Yomah; Tenasserim.—Fl. Febr.-March; Fr. Apr.-May.—s.—SS. =Metam.—SiS.

Remarks.—Wood rather heavy, brown, soft, close-grained, perishable, and soon attacked by xylophages. Yields a black varnish.

SWINTONIA, Griff.

Flowers hermaphrodite; calyx 5-lobed, imbricate. Petals 5,

adnate to the torus, imbricate, after flowering much enlarging and wing-like. Torus elongate, cylindrical, bearing the petals at its middle and the 5 stamens at the apex. Ovary sessile, with a solitary ovule suspended from the free basilar funicle. Drupes sessile and adnate to the wing-like petals, coriaceous. Seed solitary.—Trees, with alternate simple leaves. Flowers small, in terminal large but slender panicles.

Leaves uniformly green and glossy; pedicels 3-5 lin. long, the net-veination conspicuous . . . . . *S. Griffithii.*
As preceding but leaves dark-brown, the netveination obsolete . *S. Helferi.*
Leaves glaucous and opaque beneath; pedicels ½-1 lin. long; petals hardly a line long; drupes oblong . . . . *S. Schwenckii.*

1. **S. Griffithii,** Kz.; H.f. Ind. Fl. ii. 26.—A lofty evergreen tree, all parts quite glabrous; leaves crowded towards the end of the branchlets, lanceolate or oblong-lanceolate, bluntish acuminate, on an 1-1½ in. long slender petiole, 5-6 in. long, entire or slightly waved, thin coriaceous, glossy and glabrous, uniformly green, the net-veination faint; flowers rather large, pale-yellowish, on 3 to 5 lin. long strong pedicels thickened upwards, laxly cymose and forming a terminal ample but slender glabrous panicle longer than the leaves; calyx-tube cyathiform, continuous with the pedicel, the lobes very short, rounded; petals linear-lanceolate, nearly 3 lin. long, very soon enlarging; style as long as the obliquely ovoid ovary, thick, with a discoid-capitate stigma; drupes (unripe) obovate, sessile, adnate to, and supported by, the 5 spreading wing-shaped linear-lanceolate purple petals.

Hab.—Tenasserim.

2. **S. Helferi,** H.f. Ind. Fl. ii. 26.—An evergreen tree, very near to the preceding, but the branchlets stouter; leaves narrowly lanceolate, acute at the base, on a long slender petiole, bluntish acuminate, 6-10 in. long by 1-1½ broad, copiously nerved (nerves 25-30 pairs), waved-bordered, drying dark-brown; panicles much longer than the leaves, lax, spreading, quite glabrous; flowers pedicelled; drupes obovoid, ⅓ in. long, the subtending petals reflexed, 2 in. long, linear, blunt, veined, glabrous.—(After Hooker.)

Hab.—Tenasserim or Andamans.

3. **S. Schwenckii,** T. et B.; H.f. Ind. Fl. ii. 26.—*Thayet-san.*—An evergreen tree (80—120 + 60—70 + 8—10), all parts quite glabrous; bark about 3 lin. thick, rather smooth, finely transversely wrinkled; cut dry, brown; leaves oblong- to elliptically-lanceolate, on a very slender petiole 1½-1 in. long, bluntish acuminate, 3½-5 in. long, entire, firmly chartaceous or membranous, glabrous, glossy and dark-green above, beneath whitish or glaucescent, the nerves and net-veination thin, but rather conspicuous; flowers minute, yellowish

white, on less than a line long slender not thickened pedicels, very numerous, cymulose-racemose, and forming a very ample slender glabrous panicle at the end of the branches and in the axils of the upper leaves and usually 3-4 times longer than them; calyx very short, hemispherical, the lobes rotundate, obsoletely ciliolate; petals pubescent, about a line long, oblong; drupes oblong, the size of a bean, blunt, smooth and red, adnate to, and supported by, the 5 oblong-linear reflexed 2 in. long longitudinally nerved purplish wing-shaped petals.

Hab.—Very frequent in the tropical forests of Martaban down to Tenasserim, less so in those of the Pegu Yomah.—Fl. Febr.-Apr.; Fr. May.—s : l.—SS. = SiS. *Metam.*

Remarks.—Wood white, soft.

MELANORRHŒA, Wall.

Flowers hermaphrodite. Sepals 5, hood-like cohering, deciduous, valvate. Petals 5 or 6, imbricate, enlarging and becoming wing-shaped in fruit. Disk thick, hemispherical. Stamens numerous, without order inserted on the torus, the filaments capillary. Ovary stalked, with a solitary ovule suspended from the free basilar funicle; style almost lateral. Drupe coriaceous, stalked, supported by the 5 wing-shaped spreading petals. Seed solitary.—Trees, with alternate simple leaves. Flowers middling-sized, in axillary panicles.

Leaves and panicles glabrous, or the latter puberulous; fruit-stalk nearly 1½ in. long, slender . . . . . *M. glabra.*
Leaves pubescent beneath; panicle densely villous; fruit-stalk short and thick . . . . . *M. usitata.*

1. **M. glabra,** Wall.; H.f. Ind. Fl. ii. 25.—*Thit-say-pen.*—A middling-sized tree, the younger branchlets and leaf-buds tawny puberulous; leaves cuneate-oblong, decurrent on the short thick puberulous petiole, blunt or almost retuse, 6-10 in. long, entire, when full grown coriaceous and quite glabrous, the lateral nerves strong, the net-veination small and conspicuous; flowers white, middling-sized, on slender puberulous pedicels ½ an in. long, forming lax slender long-peduncled usually glabrous panicles in the axils of the upper leaves and longer than them; sepals white, lanceolate, puberulous, 4-5 lin. long, only at the base free, hood-like cohering at the apex; petals lanceolate, acute, ciliate, puberulous outside, about 5 lin. long; drupes as large as a cherry, globose or spheroid, on a very slender 1-1½ in. long stalk, red, smooth and slightly pruinous, supported by the 5 wing-shaped linear-oblong to oblong purplish stellately spreading petals about 2 in. long.

Hab.—Forests of Tenasserim.

2. **M. usitata,** Wall. ; H. f. Ind. Fl. 25.—*Thit-say-pen.*—A tree (50—60+15—30+6—9), shedding leaves in H.S., all younger parts villous; bark thin, irregularly breaking up into small angular thin flakes ; leaves oblong or obovate-cuneate, decurrent on the strong densely pubescent petiole which is often up to an inch long, blunt or acute, entire, rather chartaceous, while young on both sides densely and softly villous, when adult turning shortly and densely pubescent, 9-12 in. long, the parallel nerves and net-veination conspicuous ; flowers white, middling-sized, on 4-6 lin. long tomentose pedicels, laxly cymulose, forming densely pubescent or tomentose panicles in the axils of the upper leaves and much shorter than them ; calyx as in the former, 4-5 lin. long, puberulous; petals lanceolate, acute, 5 lin. long, pubescent ; drupes globular, the size of a cherry, smooth, on a thick hardly 4-5 lin. long stalk ; petals wing-shaped, stellately spreading, oblong, about 2 in. long, much-veined, purplish, glabrous.

Hab.—Frequent in the open forests, especially the Eng and hill Eng forests, rare in the dry forests, from Prome, Pegu, and Martaban down to Tenasserim, up to 3,000 ft. elevation ; also Ava.—Fl. March ; Fr. Apr.-May.—l.—SS.—*Lat.* Dil. Aren. Metam.

Remarks.—Wood red-brown, close and fine-grained. □′=54 pd. Used for stocks of Burmese anchors, tool-helves, &c., and is recommended for handles of tools and for machinery generally, for railway-sleepers, gun-stocks, &c. The tree exudes a black gum—the famous Martaban varnish—with which almost every vessel in a Burmese house, intended to contain either solid or liquid food, is lacquered.

PARISHIA, Hf.

Flowers dioecious. Calyx 3-4-lobed, valvate, wing-like enlarged after flowering. Petals 4, imbricate. Males : Stamens 4, inserted below the margin of the annular 4-lobed disk. Ovary rudimentary, columnar. Females : Ovary free, sessile, with a solitary pendulous ovule ; style terminal, unequally 3-cleft. Fruit coriaceous, sessile, 1-seeded.—Trees, with alternate pinnate leaves. Flowers rather small, in ample panicles.

1. **P. insignis,** H.f. Ind. Fl. ii. 30.—An evergreen tree (80—100+30—60+8—12), the younger parts tawny villous ; leaves unpaired-pinnate, the rachis and petiole terete and glabrous ; leaflets usually in 9 pairs with an odd one, ovate-oblong to ovate, a little oblique, on a short puberulous petiolule, acuminate, 4-5 in. long, chartaceous, glabrous, the nerves thin, but conspicuous on both sides ; flowers rather small, on slender 3-4 lin. long pubescent pedicels, laxly cymulose and forming an ample peduncled rusty villous panicle of about the length of the leaves ; bracts linear or linear-lanceolate, tawny or rusty pubescent, 2-3 lin. long ; calyx

rusty pubescent ; petals about 2 lin. long ; drupes coriaceous, almost globular, apiculate, the size of a cherry, densely rusty or tawny tomentose, sessile and supported by the 3 or 4 wing-shaped sepals, the latter linear-oblong, much nerved, reddish, blunt or usually notched, minutely and softly pubescent beneath, more or less glabrescent on the upper surface, 2-3 in. long.

Hab.—Frequent in the tropical forests of the Andamans ; also Tenasserim.—Fr. May.—s.—SS.=SiS.

RHUS, L.

Flowers polygamous. Calyx 4-6-parted, persistent, imbricate. Petals 4-6, imbricate. Stamens 4-6 or 10, free, inserted at the base of the annular disk ; the filaments subulate, in the females castrate. Ovary sessile, with a solitary ovule suspended from a free basilar funicle ; styles 3, short and long, free or connate. Drupes small, dry or sappy, containing a crustaceous or bony 1-seeded putamen.—Trees or shrubs, with alternate, pinnate or pinnately 3-foliolate (rarely simple) leaves. Flowers small, in axillary and terminal panicles.

Leaves glabrous, 3-foliolate, the leaflets entire ; panicles glabrous. *R. paniculata.*
Leaves pinnate, pubescent ; leaflets serrate-toothed ; panicles tomentose or puberulous ; endocarp smooth and bony . . *R. Javanica.*
As preceding, but petiole slender and glabrous ; endocarp fibrous . *R. Khasiana.*

1. **R. paniculata,** Wall. ; H.f. Ind. Fl. ii. 10.—A little leaf-shedding tree, all parts glabrous ; leaves pinnately 3-foliolate, on a 1-1½ in. long petiole ; leaflets obovate-oblong or cuneate-obovate, narrowed at the base, sessile or nearly so, blunt or bluntish, 2-4 in. long, entire, glabrous, chartaceous, conspicuously nerved on both sides ; flowers minute, pale-green, slenderly pedicelled, cymulose, forming slender, glabrous, peduncled panicles at the end of the branches and in the axils of the leaves ; petals hardly ½ lin. long, oblong, blunt ; drupes obliquely oblong, compressed, the size of a lentil, smooth and glossy.

Hab.—Not uncommon in the Eng and dry forests of Prome and Ava.—Fl. Sept. ; Fr. Jan.—l.—SS.=*Lat.* CaS.

2. **R. Javanica,** L. ; Brand. For. Fl. 119 (*R. semialata,* Murr. ; H.f. Ind. Fl. ii. 10).—A tree (25—30+8—15+1—2), probably leaf-shedding, all softer parts pubescent or tomentose ; leaves unpaired-pinnate, on a terete pubescent petiole, the rachis more or less narrowly-bordered towards the apex ; leaflets opposite, oblong, sessile, sharply but shortly acuminate, coarsely serrate-toothed, membranous, 2-3 in. long, puberulous above, softly and densely pubescent or tomentose beneath, the nerves more or less conspicuous ; flowers yellowish, small, very shortly pedicelled, clustered and forming

rusty or tawny villous or pubescent terminal large panicles; petals obovate, about a line long; drupes compressed-orbicular, the size of a lentil, greenish white, somewhat clammy, and while young puberulous.

Hab.—Not unfrequent in the hill Eng forests and drier hill forests of Martaban, at 2,000 to 4,000 ft. elevation; also Ava.—Fl. Sept.-Oct.; Fr. Apr.—l.—SS.=Metam.

Remarks.—Wood greyish white, soft and light.

3. **R. Khasiana,** H.f. Ind. Fl. ii. 10.—A large tree; leaves 1-1½ ft. long, unpaired-pinnate, the petiole terete, very slender, soft, pubescent towards the tip; leaflets in 8-12 pairs, obliquely lanceolate, almost sessile, cuneate at the base, 3-4 in. long, incised-serrate, long-acuminate, membranous, hairy chiefly on the very slender nerves beneath; flowers unknown; drupes ⅓ in. in diameter, in open panicles, orbicular-ovate, pedicelled, compressed, the epicarp papery, pale-coloured, irregularly torn, exposing a fibrous endocarp. —(From Hooker's Ind. Fl.)

Hab.—Chittagong.

TAPIRIA, Juss.

Flowers polygamous. Calyx 5-parted, imbricate. Petals 5, imbricate. Stamens 10, inserted at the base of the 5-lobed rather broad disk; anthers globular. Ovary in the males immersed in the disk, 4-5-lobed with as many styles, in the females free, half-immersed, with a solitary ovule suspended from the summit of the cavity of the cell; style short, conical. Drupe fleshy, containing a crustaceous 1-seeded putamen.—Trees or shrubs, erect or scandent, with alternate pinnate leaves. Flowers minute, in axillary and terminal panicles.

1. **T. hirsuta,** Kz.; H.f. Ind. Fl. ii. 28.—A large scandent shrub, all parts more or less hirsute; leaves unpaired-pinnate, shortly petioled, the rachis hirsute; leaflets usually in 6 pairs with an odd one, ovate or ovate-oblong, very shortly petioluled, 1-2 in. long, shortly acuminate, serrate, membranous, hirsute or sprinkled with short hairs, the midrib usually very hirsute; flowers minute, white, on 1-1½ lin. long capillary glabrous pedicels, cymulose and forming very slender axillary and terminal hirsute panicles longer than the leaves; petals ovate, acute, about ⅔ lin. long; disk yellow, 5-lobed; ovaries 5, connate, but the upper parts with the styles free, all abortive but one; drupes the size of a large pea, obliquely oblong or ovoid-kidney-shaped, fleshy, red, marked with 4 irregularly disposed tubercles (the abortive ovaries).

Hab.—Chittagong.—Fl. Febr.

ODINA, Roxb.

Flowers polygamously dioecious; calyx 4-5-lobed, persistent, imbricate. Petals 4-5, imbricate. Disk annular, 4- or 5-crenate. Males: Stamens 8-10, inserted below the margin of the disk, the filaments nearly as long as the petals. Ovary 4- or 5-parted. Females: Ovary sessile, free, with a solitary ovule attached to near the summit of the cavity; styles 3-4, thick; drupes crowned with the persistent styles, containing a hard 1-seeded putamen.—Trees, with alternate pinnate leaves. Flowers small, clustered and forming racemes or panicles.

1. **O. Wodier,** Roxb.; H.f. Ind. Fl. ii. 29; Bedd. Sylv. Madr. t. 123; Brand. For. Fl. 123.—*Na-bai.*—A tree (30—60+15—40+3—10), remaining low and stunted in sterile localities, leafless during H.S., the very young parts and leaf-buds minutely puberulous; bark 1-2 in. thick, grey, brittle, longitudinally cracked and peeling off in irregular small rough pieces; cut purplish; leaves unpaired-pinnate, glabrous, the rachis and petiole terete; leaflets usually in 3-4 pairs with an odd one, opposite, ovate-oblong to ovate, sessile or shortly petioluled or more usually decurrent on one side only, 3-5 in. long, acuminate, entire, membranous, glabrous, or while very young minutely puberulous along the nerves beneath; flowers small, purplish green, almost sessile, clustered and forming numerous simple usually drooping racemes, the males in branched (while young more or less puberulous) panicles at the end of the leafless rather thick branches; petals oblong, about a line long, uniformly greenish or usually dull-purple on the middle; drupes oblong-kidney-shaped, the size of a small bean, smooth, red, 1-seeded.

Hab.—Frequent in all sorts of leaf-shedding forests, all over Burma from Ava and Martaban down to Tenasserim and the Andamans, up to 3,000 ft. elevation. —Fl. Feb.-March; Fr. Sept.-Oct.—l.—SS.=∞ *SiS.*

Remarks.—Sap-wood rather light and coarse, of a white colour, turning pale-brown; heart-wood heavier, close-grained, of a reddish brown colour. □′ =65 pd. It is said to be very difficult to season. The heart-wood is used for sheaths of swords, spear-handles, oil-presses and rice-pounders. If well seasoned it is a good wood for cabinet-work. The tree yields a yellowish gum in considerable quantities, which furnishes an inferior varnish. The bark is good for tanning.

SPONDIAS, L.

Flowers polygamous. Calyx 4-5-cleft, imbricate, deciduous. Petals 4-5, nearly valvate. Stamens 8-10, inserted under the cup-shaped rather broad crenate disk. Ovary sessile, free, 4-or 5-celled, with a solitary pendulous ovule in each cell. Drupe fleshy, large, containing a hard and bony 3-4-celled putamen. Radicle superior.

—Trees, with alternate pinnate leaves. Flowers minute, in terminal panicles.

1. **S. mangifera,** Pers.; H.f. Ind. Fl. ii. 42; Bedd. Sylv. Madr. t. 99; Brand. For. Fl. 128.—*Gway.*—A tree (90—100 + 50—60 + 10—12), leafless during the greater part of the D.S., all parts glabrous; bark an inch thick, smooth, grey, slightly cracked; leaves unpaired-pinnate, glabrous, the petiole terete; leaflets usually in 3 to 5 pairs with an odd one, oblong to oblong-lanceolate, opposite, shortly petioluled, 3-6 in. long, shortly acuminate, membranous, entire, glabrous, the parallel numerous nerves thin and faint and uniting along the margin; flowers small, whitish, almost sessile, clustered, forming a robust glabrous panicle at the end of the thick branchlets; petals oblong-lanceolate, about 2 lin. long; disk large, fleshy; stamens 10, very short; drupes drooping, elliptical or ovoid, the size of a pullet's egg, fleshy, smooth, yellow, very acerb, but edible, containing a large fibrous-woody 5-celled putamen, of which usually only 1-2 seeds come to perfection.

Hab.—Frequent in the mixed forests, especially the upper ones, all over Burma from Chittagong, Prome, and Martaban down to Tenasserim, up to 3,000 ft. elevation. Fl. March-Apr.—Fr. C.S.—l.—SiS. = ∞ *SiS.*

Remarks.—Wood white, soft, coarse and useless. The tree yields large quantities of a transparent juice which soon hardens into a mild, insipid, yellowish gum, somewhat resembling gum-arabic.

DRACONTOMELUM, Bl.

Flowers hermaphrodite. Calyx 5-parted, imbricate. Petals 5, almost valvate. Stamens 10, inserted at the base of the crenate disk; ovary sessile, 5-celled, with a pendulous solitary ovule in each cell; styles 5, thick, ovary-shaped. Drupes globose or spheroid, fleshy, the putamen bony, 2-5-celled.—Trees, with alternate pinnate leaves. Flowers small, almost clustered, in axillary or almost terminal panicles.

1. **D. mangiferum,** Bl.; H.f. Ind. Fl. ii. 43.—An evergreen tree (90—100 + 60-70 + 8—10), the shoots tawny pubescent; leaves unpaired- (rarely and only occasionally pairedly) pinnate, the semi-terete petiole and almost terete rachis puberulous and short-hairy, more or less glabrescent; leaflets in about 6-9 pairs, alternate and opposite on the same leaf, on a very short pilose glabrescent petiolule, ovate or elliptically oblong, rounded and more or less unequal at the base, usually shortly and sharply acuminate, chartaceous, 5-6 lin. long, above (except the pubescent midrib) glabrous, beneath puberulous all over or only along the nerves and more or less glabrescent; flowers rather small, on velvety 2-3 lin. long pedicels,

racemulose, forming large axillary densely puberulous or almost velvety panicles shorter than the leaves; calyx minutely appressed puberulous, the lobes oblong, blunt; petals about 4 lin. long or longer, their tips reflexed; drupes the size of a wood-apple, somewhat depressed-globose, about 1-1¼ in. in diameter, roughish or smooth, yellowish or orange-yellowish, acerb-fleshy, but edible, containing a large, much depressed, bony, irregularly and obsoletely 10-ribbed putamen.

HAB.—Frequent in the tropical and moister upper mixed forests of the Andamans.—Fr. Apr.-May.—s.—SS. = Metam.

CONNARACEÆ.

Flowers usually hermaphrodite, regular or nearly so. Calyx 5-cleft or 5-parted, often persistent, imbricate or valvate. Petals 5, free, or sometimes slightly coherent at the middle, imbricate, rarely valvate. Stamens perigynous or hypogynous, sometimes distinctly declinate, 5 or 10, very often alternately shorter and sometimes imperfect; filaments usually united in a ring at the base; anthers usually opening inwards, didymous. Disk none, thin or incomplete. Ovary of 5 distinct one-celled carpels, either all perfect, or 1 fertile and the rest abortive, rarely reduced to 2 or 1 carpel, with 2 erect or ascending ovules in each; styles subulate or filiform. Ripe carpels usually solitary, sessile or stalked, follicle-like, usually dehiscing along the inner, rarely along the outer suture, 1- or very rarely 2-seeded. Seed with or without arillus, the testa thick, often fleshy below the middle and arillus-like. Albumen fleshy or none.—Trees or shrubs, often scandent, with alternate 1-3-foliolate or pinnate leaves. Leaves usually small, in racemes or panicles.

An order of little known value, containing only small trees and usually scandent shrubs. The Demerara zebra-wood is said to come from *Omphalobium Lamberti.*

* *Sepals imbricate. Albumen none.*

Calyx enlarged in fruit; follicle sessile . . . . . *Rourea.*
Calyx unchanged or caducous; follicle stalked . . . . *Connarus.*

* * *Sepals valvate.*

Carpels 5-7, sessile; leaves unpaired-pinnate; follicles pilose within . . . . . *Cnestis.*
Carpels 5, sessile; leaves unpaired-pinnate; follicles glabrous within . . . . . *Tæniochlæna.*
Carpels solitary; leaves 1-foliolate; small trees . . . . *Ellipanthus.*

ROUREA, Aubl.

Calyx 5-parted, the lobes imbricate, hardening and enlarging. Petals 5, longer than the calyx. Stamens 10, the 5 alternating one longer; filaments filiform, united in a ring at the base. Carpel

5, 4 of them usually imperfect and style-shaped; style subulate. Follicle sessile, usually curved outwards, at the base closely surrounded with the enlarged calyx. Arillus complete or incomplete, split. Testa smooth, glossy. Albumen none.—Shrubs or little trees, sometimes scandent, with pinnate leaves. Flowers small, in axillary panicles.

* *All parts quite glabrous. Leaflets in few (not above 6) pairs, acuminate to caudate.*

Leaflets 1½-2 in. long, the rachis and petiolules very slender . *R. pulchella.*
Leaflets 5-3 in. long, the rachis and petiole stout . . . *R. commutata.*

* * *Inflorescence, leaf-rachis, and often the under-surface of the leaflets, puberulous or shortly pilose. Leaflets in numerous pairs, small, usually retuse or rounded at the apex.*

× Sepals erect and cupular-clasping.

Leaflets pubescent or pilose beneath . . . . . *R. villosa.*
Leaflets glabrous on both sides . . . . . *R. Wallichiana.*

× × Sepals spreading.

Leaflets obliquely ovate or obovate, 2-lobed at the summit . . *R. stenopetala.*

1. **R. pulchella,** Planch.; H.f. Ind. Fl. ii. 48.—A shrub (scandent ?), all parts quite glabrous; leaves unpaired-pinnate, the petiole and rachis very slender and almost filiform; leaflets in 3 or 2 pairs with an odd one, on a very slender petiolule about 2 lin. long, ovate-lanceolate or lanceolate, 1-2 in. long, bluntish caudate-acuminate, entire, firmly chartaceous, glossy, the net-veination rather lax and very prominent on both sides; flowers small, on 4-5 lin. long very slender and glabrous pedicels, by 2 or 3, or sometimes solitary, and forming very slender glabrous raceme-like panicles or almost simple racemes in the axils of the leaves and much shorter than them; calyx-lobes rotundate-ovate, blunt, minutely ciliate; petals twice as long as the sepals, oblong.

Hab.—Tenasserim.

2. **R. commutata,** Planch.; H.f. Ind. Fl. ii. 47.—A large scandent, evergreen shrub, all parts glabrous; leaves unpaired-pinnate, glabrous, the rachis and petiole strong; leaflets usually large, in 2 or 3 pairs with an odd one, or not seldom in 4-6 pairs with or without an odd one, more or less alternate, on a rather short thick petiolule, ovate to ovate-oblong, rarely oblong-lanceolate, abruptly and bluntish acuminate, entire, almost coriaceous, glossy, usually 5-3 in. long, seldom smaller, glabrous, thinly and laxly net-veined; stipules stiff, subulate; flowers rather small, white, on 2 to 3 lin. long rather thick pedicels, forming sessile glabrous panicles much branched from the base, or racemes in the axils of the leaves and much shorter than them; sepals ovate-oblong, obsoletely ciliate, about a line long; petals twice as long, obovate-oblong, glabrous; carpels 5, tapering in a long recurved style, only one maturing; follicle obliquely ovate-oblong, nearly an inch long, acute, dehiscing along the inner suture

and bending outwards, exposing the solitary seed enveloped in the orange-coloured complete arillus.

HAB.—Not unfrequent in the tropical forests from Martaban and Tenasserim down to the Andamans; also Chittagong.—Fl. May-June.

3. **R. villosa,** Planch.; H.f. Ind. Fl. ii. 48.—A scandent shrub, the branchlets and younger parts shortly tawny tomentose; leaves pinnate, the rachis and petiole shortly and densely tomentose; leaflets small, in numerous pairs with or without an odd one, somewhat rhomboid-oblong or oblong, blunt, sessile, rounded at the base, 5-10 lin. long, coriaceous, entire, glossy and glabrous above, beneath sparingly pilose and, excepting the midrib, glabrescent; flowers small, on 1-2 lin. long hairy pedicels, forming 2-3 simple or compound densely villous or pilose racemes in the axils of the leaves and shorter than them; calyx-lobes oblong, nearly a line long, shortly pilose outside; petals linear-oblong, nearly 3 times longer than the calyx; follicles oblong, glabrous, acute, about ½ an in. long, opening along the inner edge and exposing the single oblong seed enclosed in the complete arillus.

HAB.—Tenasserim.—Fl. March.

4. **R. Wallichiana,** Planch.; H.f. Ind. Fl. ii. 49.—Leaves 6-10 in. long, the petiole pubescent; leaflets in 15-30 pairs, linear-oblong, rounded or almost cordate at the base, ½-¾ in. long, always blunt, dark-brown in drying, glabrous, above hardly shining, beneath opaque, the nerves faint; flowers ⅓ in. in diameter, on very slender pedicels exceeding or equalling the orbicular, ciliate sepals, forming slender, villous racemes panicled at the base and much shorter than the leaves; petals ¼ in. long, linear, glabrous; follicle ½-⅔ in. long, curved.—(From Hooker's Ind. Fl.)

HAB.—Tenasserim, from Moulmein southwards.

5. **R. stenopetala,** H.f. Ind. Fl. ii. 49.—A scandent shrub, the branchlets pubescent; leaves 2-4 lin. long, the petiole slender and pubescent; leaflets in 6-10 pairs, obliquely ovate or obovate, 2-lobed at the apex, contracted cordate and very oblique at the base, ¾-1 in. long, shining on both sides, the midrib beneath pubescent, the nerves and net-veination obscure; racemes apparently almost reduced to fascicles; bracts ovate, ferruginous; pedicels slender; sepals lanceolate, acute, spreading, imbricate, pubescent at the tip; petals linear, very narrow, 2½ times longer than the sepals; stamens 10, alternately shorter and monadelphous at the very base; ovaries 5, free, pilose; styles filiform, almost glabrous, terminated by a capitate stigma.

HAB.—Southern Tenasserim.—Fl. Jan.

CONNARUS, L.

Calyx 5-parted, the lobes not enlarging, imbricate, persistent or deciduous. Petals 5, longer than the calyx, sometimes slightly cohering. Stamens 10, alternately shorter and sometimes castrate; filaments filiform, united in a ring at the base. Disk none or thin and annular. Carpels 5, 4 of which usually minute or quite suppressed; style subulate. Follicle stalked, coriaceous, opening along the inner suture, one-seeded. Arillus incomplete, lobed and adnate to the broad hilum. Testa glossy. Albumen none.—Little trees or shrubs, usually scandent, with alternate pinnate or rarely pinnately 3-foliolate leaves, the leaflets in few pairs. Flowers small, in axillary panicles or rarely racemes.

* *Follicles tomentose outside.*

Rachis of leaves and leaflets beneath pubescent; follicles tomentose . . . . . *C. semidecandrus.*

* * *Follicles more or less pubescent or velvety within, glabrous or nearly so outside.*

× Petioles and leaflets beneath pubescent, the nervation very indistinct . . . . . *C. Griffithii.*

× × Leaflets perfectly glabrous; follicles stalked.

\+ Follicles chartaceous or thin coriaceous, deeply striate.

A large tree; follicles about an inch long or longer . . . *C. paniculatus.*

Climber; follicles about ½ in. long or somewhat longer . . . *C. gibbosus.*

Apparently like preceding, but the follicles nearly cylindrical . *C. latifolius.*

\+ \+ Follicles woody.

Leaflets thick, coriaceous, large; follicles about 2 in. long . . *C. grandis.*

1. **C. semidecandrus,** Jack.; H.f. Ind. Fl. ii. 52.—A small tree, the young shoots softly rusty villous; leaves unpaired-pinnate; leaflets in 1-2 pairs with an odd one, ovate-lanceolate to broadly lanceolate, acuminate, entire, smooth above, slightly villous beneath, 3-4 in. long, the nerves lucid; flowers light-bluish, in brownish villous panicles at the end of the branchlets and in the axils of the upper leaves; bracts small; sepals erect, tomentose, reddish; petals longer than the sepals; stamens 10, 5 of them exserted and fertile, the other 5 short and sterile, all united into a ring at the base; follicle tomentose, rusty-coloured, 2-valved, 1-seeded, the seed caruncled.—(From Jack's Mal. Misc.)

Hab.—Southern Tenasserim (according to Hooker).

2. **C. Griffithii,** H.f. Ind. Fl. ii. 52.—Branches slender, pubescent; petiole pubescent; leaflets ovate- or elliptically lanceolate, 3-5 in. long, acuminate, thinly coriaceous, beneath finely pubescent with rusty hairs, the midrib distinct, the nerves very faint, oblique; flowers ⅛ in. long, in rusty pubescent panicles; sepals linear-oblong; petals more than twice as long, glabrous, ligulate; filaments almost glabrous.—(From Hooker's Ind. Fl.)

Hab.—Southern Tenasserim.

3. **C. paniculatus,** Roxb.—A large timber tree, the young shoots clothed with a little rusty down; leaves unpaired-pinnate, about a foot long, the petiole smooth; leaflets in 2 or 3, rarely in a single pair, with an odd one, almost opposite, ovate-oblong, bluntish acuminate, 3-6 in. long, smooth and glossy; flowers decandrous, in large spreading rusty pubescent panicles at the end of the branchlets and in the axils of the upper leaves; bracts small, caducous, villous; sepals oblong, concave; petals somewhat longer than the sepals, linear-lanceolate (without bristles at the base); filaments alternately longer, united at the base; carpels and the long style hairy, the stigma somewhat capitate.—(From Roxburgh.)

Hab.—Chittagong.—Fl. June.

4. **C. gibbosus,** Wall.; H.f. Ind. Fl. ii. 52.—A large half-scandent shrub, the young shoots rusty puberulous; leaves unpaired-pinnate, the rachis and petiole glabrous; leaflets in 2 or a single pair with an odd one, opposite and alternate, oblong to oblong-lanceolate and ovate-oblong, on a short and thick petiolule, rounded or obtuse at the base, 4-5 in. long, bluntish acuminate, entire, rather coriaceous, glabrous, more or less glossy above; flowers small, white, on very short thick densely rusty-puberulous pedicels, cymulose and forming large terminal and axillary rusty-tomentose or densely puberulous panicles usually longer than the leaves; calyx brown, densely rusty-puberulous, the lobes linear-oblong, acute, 1½ lin. long; petals in opening ovate-oblong, lengthening and becoming linear, 2-3 times as long as the calyx, slightly puberulous or glabrous, villously-ciliate; filaments very long and slender, glabrous; ovary densely rusty-villous; follicles ovoid-oblong and somewhat compressed, narrowed in a thick stalk, more or less transversely nerved-striated, about an inch long, slightly rusty-puberulous, but soon glabrescent; seed oblong, glossy black, the arillus lobed, not half so long.

Hab.—Common in the tropical and hill forests, entering also the poonzohs, from Chittagong, the southern slopes of the Pegu Yomah and Martaban down to Tenasserim and the Andamans, up to 3,000 ft. elevation.—Fl. Apr.-May; Fr. May-June—l.×s.—SS. = *Metam.* Dil.

5. **C. latifolius,** Wall.; H.f. Ind. Fl. ii. 53.—Leaflets elliptically oblong with contracted, blunt or notched points, 4-7 in long, coriaceous, quite glabrous, the nerves in 5 pairs, slender, arched, the net-veination indistinct; flowers $\frac{1}{6}$ in. long, in widely spreading panicles; follicles $\frac{3}{4}$ in. long by $\frac{1}{3}$ broad, shortly sub-cylindrical, with very round tops, and an obscure sub-lateral point, abruptly contracted into the stalk, very turgid, finely puberulous within.—(From Hooker's Ind. Fl.)

Hab.—Tenasserim, from Moulmein southwards.

6. **C. grandis,** Jack; H.f. Ind. Fl. ii. 53.—A moderately sized tree, all parts glabrous; leaves unpaired-pinnate, the petiole very stout; leaflets in 1 or 2 pairs with an odd one, very large (8-14 in. long), ovate-lanceolate to elliptically oblong, on short stout petiolules, bluntish acuminate or blunt, thick coriaceous, polished, the transverse nerves distinct beneath; flowers ¼ in. long, in spreading greyish puberulous panicles; sepals linear-oblong, blunt; petals twice as long, linear, dilated upwards, almost glabrous; filaments puberulous, the alternate ones 3 times longer; follicles oblique, contracted into the stalk, rounded at the sutures, about 2 in. long by ¾-1 broad, turgid, woody, glabrous, coarsely striate (smooth, according to Jack), red.

Hab.—Tenasserim or Andaman Islands (according to Hooker).

CNESTIS, Juss.

Flowers polygamously dioecious. Calyx 5-parted, the sepals valvate, persistent and spreading under the fruit. Petals 5, shorter than the calyx. Stamens 10, almost equal; filaments filiform, free. Carpels 5, sessile, the styles short. Follicles 1 or 2, coriaceous. Arillus none. Albumen fleshy.—Little trees or usually scandent shrubs, with pinnate leaves, the leaflets in numerous pairs. Flowers solitary or clustered, in small racemes or rarely in panicles axillary or from the branches.

Scandent shrub; sepals a line long; leaflets usually opposite . . *C. platantha.*
Erect small tree or shrub; sepals 2 lin. long; flowers long-pedicelled; leaflets often alternate . . . . . *C. ramiflora.*

1. **C. platantha,** Griff.—*Taw-kyet-louk* or *kyet-mouk-nee.*—A large scandent shrub, in dry situations remaining low, all softer parts tomentose or pubescent; leaves unpaired-pinnate, the rachis and petiole tomentose; leaflets in numerous pairs with an odd one, opposite or nearly so, oblong or nearly so, often a little rhomboid, on a very short thick tomentose petiolule or almost sessile, varying in size from 1 to 3 in. long, blunt or shortly and bluntish acuminate, rounded or almost cordate at the usually somewhat oblique base, entire, when adult almost coriaceous, above glabrescent, beneath softly pubescent; flowers small, yellowish, scented, on very short pubescent pedicels or almost sessile, forming numerous tawny tomentose, slender, simple or slightly branched racemes usually arising from above the scars of the fallen leaves or in the axils of the leaves themselves and much shorter than them; sepals linear-oblong, pubescent, slightly imbricate at the base or almost valvate, about a lin. long; petals 5, occasionally 6, linear-oblong, blunt or notched, as long as the sepals, glabrous; carpels 5-7, tomentose; follicles oblong-lanceolate, often paired, sessile, bluntish acuminate,

velvety-tomentose outside and bright red, densely tawny setose within, thick and fleshy coriaceous, acid and edible.

Hab.—Frequent all over Burma in the tropical and low forests from Pegu and Martaban down to Tenasserim and the Andamans.—Fl. R. S.; Fr. Apr.-May.—s: l.—SS.=petrophilous, *Metam. Lat. p.*

Remarks.—Wood soft and white.

2. **C. ramiflora,** Griff.—Very like the preceding, but an erect shrub or small tree and the leaflets much alternate and usually more acute; flowers larger, on longer pedicels; sepals about 2 lin. long; rest as in preceding species.

Hab.—Tenasserim.

ELLIPANTHUS, Hf.

Calyx 5-parted, not enlarging, nearly erect, valvate. Petals 5, longer than the calyx, imbricate. Stamens 10, the alternating 5 without anthers; filaments short, subulate, united in a tube at the base. Carpel solitary, dehiscing along the outer suture, tapering in a short style. Follicle stalked, coriaceous, glabrous within. Arillus basilar. Albumen none.—Small trees or shrubs, with 1-foliolate leaves. Flowers small, in axillary short racemes.

× Both surfaces of leaf glabrous.
Leaves and petiole glabrous . . . . . *E. calophyllus.*
Midrib beneath and petiole puberulous . . . . . *E. Helferi.*
× × Leaves pubescent or puberulous beneath . . . *E. tomentosus.*

1. **E. calophyllus,** Kz.; H.f. Ind. Fl. ii. 55.—A little evergreen tree, 15 to 25 ft. high, with a girth of 2-3 ft., the leaf-buds tawny pubescent; leaves 1-foliolate, ovate-oblong to oblong, on a glabrous petiole an inch long or longer, bluntish acuminate, 5-6 in. long, almost coriaceous, entire, glabrous, copiously and elegantly net-veined on both sides, the nerves beneath reddish; flowers rather small, on straight rather short densely puberulous pedicels, forming short densely puberulous axillary racemes hardly an inch long; petals linear-oblong, densely velvety, about 3 lin. long; follicles obliquely oblong, tapering in a short and thick stalk, compressed, apiculate, about an inch long, coriaceous, velvety-tomentose, glabrous within.

Hab.—Frequent in the tropical forests of the Andamans.—Fl. May; Fr. June-July.—s.—SS.=Metam.

2. **E. Helferi,** H.f. Ind. Fl. ii. 55.—A tree or shrub (?), the younger parts all densely puberulous; leaves 1-foliolate, ovate-lanceolate to lanceolate and linear-lanceolate, on a 6-8 lin. long densely puberulous petiole, acuminate, obtuse at the base, 4-7 in. long, entire, chartaceous, laxly and thinly net-veined, the midrib beneath puberulous; flowers forming very short puberulous axillary

racemes or rather fascicles; expanded flowers and fruits not seen, the buds ⅛ in. long.

Hab.—Tenasserim or Andamans.

3. **E. tomentosus,** Kz.; H.f. Ind. Fl. ii. 56.—A small evergreen tree, the younger parts all densely tawny tomentose; leaves 1-foliolate, oblong to oblong-lanceolate and lanceolate, on a densely tawny pubescent petiole about ½ in. long, short and bluntish acuminate, 4-6 in. long, entire, coriaceous, elegantly net-veined on both sides, above glabrous and glossy, beneath more or less tawny or yellowish tomentose or pubescent, sometimes almost glabrescent; flowers rather small, on very short thick pedicels, forming short tomentose axillary branched racemes or small panicles; petals oblong, blunt, about 2 lin. long, densely tomentose; follicles obliquely oblong, apiculate, somewhat compressed, about 2 in. long, tapering in a rather short and thick stalk, velvety tomentose; seed large, glossy-black.

Hab.—In the tropical forests of the southern slopes of the Pegu Yomah and Tenasserim.—Fl. Jan.; Fr. March-Apr.—s.

LEGUMINOSÆ.

Flowers hermaphrodite, irregular or regular. Calyx various, 5-merous, regular or irregular, imbricate or valvate, rarely the sepals all free. Corolla of 5 or rarely fewer petals, or wanting altogether, perigynous or rarely hypogynous, irregular and more or less pea-flower-shaped or regular, the lobes or petals imbricate or valvate. Stamens 10, rarely fewer or indefinite, united in 1 or 2 sheaths or free. Ovary of a single excentrical carpel with 1 or more ovules on the ventral suture; style simple. Fruit a pod opening along one or both sutures or indehiscent, from chartaceous to fleshy and woody. Arillus more or less developed or wanting. Cotyledons large, the radicle short. Albumen none or scanty, very rarely copious.—Trees, shrubs, or herbs, sometimes climbing, with alternate or very rarely opposite, compound or simple leaves. Stipules and stipulets usually present. Flowers various, solitary or variously arranged in axillary or terminal inflorescences.

One of the largest orders and second only to *Compositæ*, in Burma represented by about 350 members and the richest in species. The petals in *Papilionaceæ* are called differently from those in most other orders, *viz.*, the upper petal is called the *standard*, the lateral ones go by the name of *wings*, while the 2 lowermost form the *keel* or *keel-petals*.

To the forester the family is of great importance, and many of the excellent timbers, like black- or rose-wood, sandal-wood, sissoo,

iron-wood, sha, &c., &c., are the produce of leguminose trees. The zebra-wood of Rio Janeiro comes from *Centrolobium robustum*. The seeds of many herbaceous species are common articles of food, under the name of pulses, such like peas, beans, pigeons' beans, lentils, &c. Indigo, sappan-wood, log-wood, Pernambuco wood, and many other dyes belong here. The fibre of *Crotalaria juncea* furnishes the sún or Bengal hemp of commerce, while the liber of some *Bauhinias* yields also inferior cordage. The bark of others, especially *Mimoseæ*, are good for tanning purposes. Gums and resins, such as gum kino, American gum-anime, and African copal, gum dracon, balsam of copaiva, gum-arabic, &c., are all produced from trees of this order. The seeds of several species, like *Pongamia*, yield good oil, while the fruits of others like *Cynometra*, tamarind, carob, &c., are edible. Medicinal properties of various nature, but too numerous for enumeration, are met with amongst these leguminose plants, and the senna is of commercial importance.

SUB-ORD. I. *Leguminosæ proper.—Flowers more or less irregular. Petals imbricate.*

* *Upper petal (standard) always outside in bud. Stamens united in 1 or 2 sheaths, with or without a more or less free vexillar one, rarely free.*

× Stamens 10, all free or nearly so. Leaves pinnate.

Pods thick, fleshy coriaceous, dehiscent; arillus complete; stipules and stipulets present . . . . . *Arillaria.*

Pods moniliform, terete or winged, indehiscent or nearly so; arillus none; stipules, but no stipulets . . . . . *Sophora.*

× × Stamens united in 1 or 2 sheaths, with or without a vexillary free one.

\+ Pods continuous, not articulate.

○ Pod indehiscent, usually large. Leaves pinnate.

† Pod not winged.

Pod short and thick; leaflets opposite . . . . . *Pongamia.*

Pod reniform or moniliform, coriaceous or drupaceous; leaflets alternate . . . . . *Drepanocarpus.*

†† Pods winged one way or other, flat.

Leaflets opposite; pods narrowly winged along the upper or both sutures . . . . . *Derris.*

Leaflets alternate; pods oblong or linear, usually several-seeded, broadly winged all round; anthers basifix . . . . . *Dalbergia.*

Leaflets alternate; pods irregularly orbicular and broadly winged all round, the solitary seed central; anthers versatile . . *Pterocarpus.*

○ ○ Pods dehiscent (very rarely indehiscent, and in this case the leaves not pinnate).

† Leaves pinnate (rarely reduced to 3 or 1 leaflet). Upper stamen usually free, the others united in a sheath, or very rarely all united.

△ Pods not chambered inside.

Anthers not terminated with a gland; pods often more or less woody; disk cup-shaped or angular . . . . . *Millettia.*

△ △ Pods chambered inside.

Anthers terminated by a gland; leaves from pinnate to pinnately 3-1-foliolate . . . . . *Indigofera.*

Anthers blunt, without gland; leaves pinnate . . . . *Sesbania.*

†† Leaves simple or digitately compound or pinnately 3-1 foliolate. Upper stamen usually free, at least at the base.
△ Leaves simple or digitately 3-foliolate.
Pods inflated . . . . . *Crotalaria.*
Pods flat-compressed . . . . . *Priotropis.*
△ △ Leaves pinnately 3-1-foliolate.
‡ Pods indehiscent, bearing the seed at the upper end, the lower wing-like expanded and sterile . . *Butea.*
‡‡ Pods dehiscent.
§ Erect trees or shrubs.
Prickly armed; leaves not resinous-gland-dotted, 3-foliolate . *Erythrina.*
Unarmed; leaves more or less gland-dotted, 3-1-foliolate; pods 1-2-seeded, inflated . . . . . *Flemingia.*
Unarmed; leaves beneath resinous-gland-dotted, 3-foliolate; pods several-seeded, torose . . . . . *Cajanus.*
§§ Climbers or twiners.
Calyx after flowering enlarging and scarious; leaves resinous-dotted . . . . . *Cylista.*
Calyx unchanged; leaves not resinous-dotted.
|| Flowers from knots (reduced ramifications) along rachis.
Standard shorter than the wings; bracts often large, but deciduous . . . . . *Mucuna.*
Standard much longer than the wings. Bracts persistent . . *Dioclea.*
As former, but bracts deciduous and small; the endocarp separating and enclosing the seeds . . . . . *Canavalia.*
|| || Rachis of inflorescence not thickened at the insertion of the flowers; calyx-tube cylindrical, longer than the lobes; bracts persistent . . . . . *Clitoria.*
++ Pods articulate, the articles dehiscent or indehiscent.
Abnormal genus; pods small, 1-seeded, indehiscent . . . *Lespedeza.*
Pods 2- many-seeded; leaves pinnately 1-3-foliolate; leaflets stipellate . . . . . *Desmodium.*
Pods 2- many-seeded, moniliform; leaves pinnate; stipulets none . *Ormocarpum.*
** *Upper petals (standard) always inside, or sometimes the petals wanting or reduced in number.*
× Petals all developed, but unequal. Seeds with albumen.
○ Anthers usually basifix, opening by pores.
Leaves abruptly pinnate; pods dehiscent or indehiscent, chambered inside . . . . . *Cassia.*
○ ○ Anthers versatile, opening by longitudinal slits.
+ Leaves simple or 2-lobed, rarely 2-foliolate. Calyx spathaceous or valvately-sepalled . *Bauhinia.*
++ Leaves bipinnate. Sepals more or less valvate.
Spiny armed; pods chartaceous, torose or almost moniliform, indehiscent . . . . . *Parkinsonia.*
Unarmed; pods rigidly coriaceous, flat, dehiscent . . . *Poinciana.*
×× Albumen none.
○ Leaves usually bipinnate. Sepals more or less imbricate. Petals 5, all developed. Anthers versatile.
+ Pods not winged.
Pods compressed, coriaceous or thick, dehiscent or not . . . *Cæsalpinia.*
++ Pods winged or wing-like extended, indehiscent.
† Calyx much imbricated.

Stigma peltate; pod flat, both margins wing-like extended; trees . . . . . *Peltophorum.*
Pods samaroid with basal seed; prickly climbers . . . . *Pterolobium.*
Stigma minute; pod flat, thin, the upper margin winged; climbers . . . . . *Mezoneurum.*

†† Calyx almost valvate.

Trees; pod winged only along the upper suture . . . . . *Acrocarpus.*

○○ Leaves usually abruptly, very rarely unpaired-pinnate or 1-foliolate. Sepals imbricate or valvate. Petals 5 or fewer or none. Anthers versatile.

\+ Pods dry, coriaceous or crustaceous.

† Bractlets persistent, enclosing the flower-bud.

△ Seeds without arillus.

Petals 5, the lower 2 minute or rudimentary; stamens 10, connate, the 10th free; leaves unpaired-pinnate . . . . *Amherstia.*
Petals 1 only, the others suppressed; sepals 4; leaflets in 1 or several pairs . . . . . *Macrolobium.*

△△ Seeds arillate.

Sepals and pod echinate; calyx valvate or nearly so . . . *Sindora.*
Sepals and pod smooth; calyx-segments imbricate . . . . *Pahudia.*

†† Bractlets minute or very caducous.

Sepals 4; perfect petals 3, rudimentary ones 2; stamens monadelphous, 3 of them perfect; pods thick, indehiscent, with pulpy acid mesocarp . . . . . *Tamarindus.*
Sepals 4; petals none; stamens 3-9; leaves abruptly pinnate . *Saraca.*

++ Pods fleshy or fleshy coriaceous.

Sepals 4-5; petals 5; stamens 10 or more; leaflets in 1 or several pairs . . . . . *Cynometra.*

SUB-ORD. II. MIMOSEÆ.—*Flowers regular. Sepals and petals valvate and often united. Stamens definite or very numerous.*

* *Stamens definite* (5 *or* 10).

○ Flowers in spikes or racemes; stamens 10; petals free or connate.

Flowers sessile; pods often very large, woody with thick sutures, the valves transversely articulate within the sutures . . *Entada.*
Flowers shortly pedicelled; pods thin coriaceous, turgid, inside transversely septate between the seeds, dehiscing . . . *Adenanthera.*

○○ Flowers in globose or pear-shaped heads.

Flower-heads large, the lower flowers neuter with 10 long monadelphous staminodes; pods coriaceous, indehiscent . . *Parkia.*
Flower-heads small; pods woody, elastically dehiscing . . *Xylia.*

** *Stamens indefinite, usually very numerous.*

\+ Seeds not arillate.

Stamens free or rarely united at the base only; pods various . *Acacia.*
Stamens united in a tube; pods straight . . . . . *Albizzia.*
As preceding, but pods screw-like twisted . . . . . *Pithecolobium.*

++ Seeds arillate.

Stamens united in a tube . . . . . *Inga.*

SUB-ORD. I. LEGUMINOSÆ PROPER.—*Flowers more or less irregular and often papilionaceous. Petals imbricate.*

* *Standard always outside in bud.*

ARILLARIA, Kz.

Calyx wide, the 2 upper teeth somewhat larger. Standard almost orbicular; wings and keel almost conform, securiform-falcate; all petals free and shortly clawed. Stamens 10, all free and fertile, unequal, the anthers versatile. Ovary shortly and thick-stalked, with 2 ovules; style filiform, revolute, the stigma lateral. Pod oblong, terete, fleshy coriaceous, dehiscing along both sutures. Seeds 1 or 2, large, perfectly enveloped by the scarlet arillus.—Trees, with unpaired-pinnate leaves, the leaflets opposite, stipellate. Flowers racemose, in terminal panicles.

1. **A. robusta,** Kz.—*Kway-tanying.*—An evergreen tree (40—50+15—25+4—5), the young shoots tawny velvety tomentose; bark longitudinally and obsoletely fissured, dark, rough, like that of *Erythrina Indica;* leaves unpaired-pinnate, 1-1½ ft. long, the rachis tawny pubescent; stipules persistent, linear-subulate, about 2 lin. long, pubescent; leaflets in 4 or 5 pairs, oblong, on a strong 2 lin. long pubescent petiolule, acute or apiculate, 3-4 in. long, entire, thin coriaceous, above glabrous when full grown, beneath minutely tawny pubescent; flowers rather large, dull-white, on short thick tomentose pedicels, racemose and collected into robust, rusty or tawny tomentose, terminal panicles; bracts persistent, linear, 2-3 lin. long, tomentose; calyx wide, nearly 3 lin. deep, densely tomentose; corolla glabrous, about 3 lin. long; ovary villous; pods oblong or elliptically oblong, at the base contracted in a short thick pubescent stalk, acute, fleshy-leathery, leather-yellow, slightly pubescent or almost glabrous, containing a single or rarely 2 large glossy black seeds enveloped in a scarlet or blood-red fleshy arillus.

Hab.—Not unfrequent in the tropical forests of the southern spurs of the Pegu Yomah and in Upper Tenasserim.—Fl. Apr.; Fr. June.—s.—SS. = Lat. p.

SOPHORA, L.

Calyx-teeth very short. Standard broad, erect or reflexed; wings oblong, erect, free; keel-petals like the wings or rather longer, scarcely united. Stamens 10, free, or 9 of them slightly connate in a ring at the base; anthers all conform. Ovary shortly stalked, with several ovules; style incurved, with a minute terminal stigma. Pods moniliform, fleshy coriaceous or woody, indehiscent or finally dehiscing in 2 valves, each seed enclosed in a separate partition.—Shrubs or trees, with unpaired-pinnate leaves, the stipulets wanting or minute and setaceous. Flowers rather conspicuous, in simple racemes or racemose panicles. Bracts small, deciduous; bractlets usually none.

1. **S. tomentosa,** L.; Bedd. Sylv. Madr. 89.—*Thin-bo-ma-jee.*—An evergreen treelet (15—20 + 6—10 + 1—1½), often remaining shrubby, all parts softly and shortly tomentose; leaves unpaired-pinnate, ½-1 ft. long, the rachis pubescent; leaflets in 5-8 pairs with an odd one, very shortly petioluled, elliptical to oval, very blunt, 1-1½ in. long, thin coriaceous, entire, glabrous above, shortly and softly pubescent beneath; flowers middling-sized, yellow, on 2-3 lin. long tomentose pedicels, forming a velvety-tomentose terminal raceme; calyx obliquely truncate, obsoletely toothed, about 3 lin. wide, tomentose; corolla glabrous, about ½ in. long or somewhat longer; pods moniliform, 2-3 in. long, shortly stalked, acuminate, velvety tomentose.

Hab.—Not unfrequent in the forests of the coasts of the Andamans; also Pegu.—s.—SS. = SiS.

PONGAMIA, Vent.

Calyx truncate. Standard orbicular, with inflexed basilar auricles; keel slightly incurved, blunt. Stamens 10, the vexillar one free at the base and united from the middle with the others in a tube; anthers uniform. Ovary nearly sessile, with 2 ovules; style incurved; stigma small, terminal. Pod broadly and obliquely oblong or slightly falcate, thick, but flat, 1-seeded, indehiscent, the sutures blunt without wings. Seeds kidney-shaped.—Trees, with unpaired-pinnate leaves, the leaflets opposite, without stipulets. Flowers in axillary racemes. Bracts very deciduous, bractlets minute or none.

1. **P. glabra,** Vent.; H.f. Ind. Fl. ii. 240; Bedd. Sylv. Madr. t. 177; Brand. For. Fl. 153.—*Theng-weng* or *Thin-win.*—A leaf-shedding tree (40—50+10—15+3—6), all parts glabrous, or the very young shoots sparingly appressed silk-hairy; leaves ½-1 ft. long, unpaired-pinnate, glabrous; leaflets in 2-4 pairs, from ovate and broadly elliptical to elliptically oblong, on a 2-3 lin. long petiolule, shortly and bluntish acuminate, 1½-4 in. long, entire, membranous; flowers middling-sized, pale purple with white standard, on minutely puberulous or glabrous 2-3 lin. long pedicels, forming a glabrous or almost glabrous rather short raceme in the axils of the leaves; calyx wide, about 1½ lin. deep, minutely puberulous; corolla glabrous, nearly ½ an in. long; ovary pubescent; pods obliquely elliptically oblong, at the base narrowed in a very short thick stalk, mucronate-acute, 1½ to 2 in. long, very thick and coriaceous, glabrous, obsoletely rimose-veined, 1- rarely 2-seeded.

Hab.—Common in the tidal and beach forests all along the coasts, from Chittagong down to Tenasserim and the Andamans.—Fl. Feb.-March; Fr. R.S.—l.—SS. = All. Aren.

Remarks.—Wood white, turning yellowish, light, coarse-fibrous. Seeds yield a clear lamp-oil, known under the name of karanj oil.

DREPANOCARPUS, C. Mey.

Calyx bell-shaped, the teeth shorter or longer. Standard broadly ovate or orbicular, without appendages, glabrous or silk-hairy; wings oblong, often falcate; keel incurved, on the back united with the petals or free. Stamens united in a single slit sheath with the vexillar one free or not, or forming 2 separate sheaths; anthers versatile. Ovary shortly stalked, with 1-3 ovules; style incurved, filiform; stigma small, terminal. Pods broadly falcate to reniform and lunate, flat or somewhat convex, thick coriaceous to almost fleshy, indehiscent, 1-3-seeded, entire or more or less moniliform contracted between the seeds. Seeds more or less compressed.—Trees or shrubs, erect or scandent, with unpaired-pinnate leaves, the leaflets usually alternate without stipulets. Stipules sometimes spiny-indurating. Flowers in axillary or terminal racemes or panicles. Bracts small, deciduous; bractlets sometimes persistent.

* *Corolla pubescent outside or glabrous. Stamens united into a single sheath. Pods usually* 1*-seeded.*

Leaflets ½ in. long; calyx a line long . . . . . *D. spinosus.*
Leaflets about an inch long; calyx 1½ lin. long . . . . *D. monospermus.*

* * *Corolla glabrous. Stamens united into* 2 *separate sheaths. Pods* 1*-3-seeded, moniliform-constricted between the seeds (if more than one seed).*

Climber; panicle almost glabrous; pods thick coriaceous . . *D. Cumingii.*
Tree; panicle rusty-villous; fully ripe pods thick and fleshy-coriaceous . . . . . *D. reniformis.*

1. **D. Cumingii,** Kz. (*Dalbergia Cumingii,* Bth.).—A tree-like scandent shrub, all parts glabrous or the young shoots minutely puberulous; leaves unpaired-pinnate, 3-5 in. long, the rachis glabrous, or while young puberulous; leaflets alternate, in 3-4 (rarely 1-2) pairs, from oboval to elliptical and oblong, on a slender 1-2 lin. long petiolule, blunt or bluntish apiculate or rarely notched, 1-2 in. long, chartaceous, entire, glabrous or minutely puberulous beneath, very glossy above; flowers very shortly pedicelled, forming a dichotomously branched peduncled puberulous or glabrous terminal and axillary panicle shorter than the leaves; calyx deeply lobed, glabrous; pods almost sessile, coriaceous, rather flat and slightly lacunose, without wings, ½-3 in. long, 1-3-seeded and much contracted between the seeds, glabrous, obversely oval and rounded with a short point, or, if 1-seeded, obversely oval.

Hab.—Tenasserim.

Remarks.—Is a dye-wood and furnishes the Kayu lakka of commerce.

2. **D. reniformis,** Kz. (*Dalbergia reniformis,* Roxb.; H.f.

Ind. Fl. ii. 238).—*Htouk-ma.*—A tree (30—40+8—15+3—4), shedding leaves in H.S., in the young shoots rusty or tawny pilose and glabrescent; bark about 1-2 lin. thick, blackish, rather even, peeling off in small flakes intermixed with little warts; leaves unpaired-pinnate, fugaceously pilose while young; leaflets alternate, in 3-5 pairs, from ovate-oblong to ovate, bluntish or bluntish apiculate with a mucro, 2-3 in. long, entire, chartaceous, glabrous; flowers small, white, very shortly pedicelled, forming dichotomously branched peduncled rusty or tawny villous or tomentose panicles in the axils of the young leaves or along the leafless branchlets; calyx rusty villous, about 1½ lin. deep, the teeth acute; corolla glabrous, 2½ to nearly 3 lin. long; stamens in 2 separate sheaths; ovary villous; pods consisting of 1 or 2 unequally reniform-obovate joints, while unripe flat, but finally drupe-like thickened, fleshy, 3-4 lin. thick and minutely warted or torulose, at the base tapering in a short stalk, at the apex laterally pointed, 1-1½ in. long.

Hab.—Common in the swamp forests of Pegu and Martaban down to Upper Tenasserim.—Fl. Febr.-March; Fr. Apr.-June.—s.—SS.=*All.* Metam.

Remarks.—Wood white, turning yellow, coarsely fibrous, light, very perishable.

3. **D. spinosus** (*Dalbergia spinosa*, Roxb.; H.f. Ind. Fl. ii. 238).—*Yay-chin-ya.*—A large shrub with a tendency to climb, the branches usually armed with long straight or hook-like twisted often spiny sterile branchlets, all parts glabrous; leaves unpaired-pinnate, 1-2 in. long, the rachis filiform; leaflets in 3-5 pairs, alternate, obversely oval, blunt or notched, on a slender ½ a lin. long petiolule, about ½ in. long, entire, membranous, glabrous, glaucous-green, turning brownish in drying; flowers small, white, with a yellowish standard, on capillary about ½-1 lin. long pedicels, forming a simple or branched axillary raceme shorter than the leaves, the rachis filiform; calyx about a line deep, glabrous, the teeth long, blunt, the lowermost more than doubly longer than the others; corolla glabrous, about 1½ lin. long, the petals shortly clawed; stamens 10, in a single slit sheath; anthers 4-celled, the cells globular; ovary glabrous; pod compressed, reniform, ⅔-1 in. long, blunt with a mucro, at the base contracted in a 3 lin. long slender stalk, almost smooth and glabrous, coriaceous, 1-seeded.

Hab.—Frequent in the tidal forests along the coast from Chittagong down to Tenasserim.—Fl. May-June; Fr. close of rains.—s.—SS.=Sal.

Remarks.—Wood soft, beautifully silvery white, close- and straight-grained. The roots powdered absorb alcohol, and a spoonful of the powder in a tumblerful of water is said to be sufficient to destroy in less than half an hour the effects of alcohol even in cases bordering on delirium tremens.

4. **D. monospermus** (*Dalbergia monosperma*, Dalz.; H.f. Ind. Fl. ii. 237).—A scandent shrub, with the branchlets usually hook-

like or tendril-like recurved, the young shoots slightly puberulous; leaves unpaired-pinnate, about 2 in. long, the young rachis slightly puberulous; leaflets usually in 2 pairs, alternate, obovate to cuneate-obovate, on a slender about a line long puberulous petiolule, more or less retuse, about an inch long or somewhat longer, entire, membranous, while young sprinkled with minute appressed hairs; flowers small, white, on puberulous pedicels up to ½ a line long, forming a short tawny puberulous raceme or racemose cyme in the axils of the leaves; calyx about 1½ lin. long, almost glabrous, the teeth short and broad, blunt; corolla glabrous, about 3 lin. long, the petals long-clawed; stamens 10, united in a single slit sheath; ovary glabrous; pods compressed, lunately-oblong, ⅔-1 in. long, acute, at the base contracted into a short stalk, smooth, brown, 1-seeded.

Hab.—Tidal jungles of Upper Tenasserim.—Fl. March.

DERRIS, Lour.

Calyx truncate or very shortly and broadly toothed. Standard obovate or orbicular; keel slightly incurved. Upper stamen usually free at the base, but united from the middle with the others in a slit sheath; anthers uniform. Ovary sessile or shortly stalked, with several ovules; style incurved, with a small terminal stigma. Pod flat, oblong or linear, thin or coriaceous, indehiscent, the upper or both sutures bordered with a narrow wing. Seeds 1-2, or rarely 3, very flat, orbicular or reniform.—Tall woody climbers or rarely erect trees with unpaired-pinnate leaves, the leaflets opposite; stipulets small and bristle-like or none. Flowers in axillary racemes. Bracts and bractlets small and deciduous.

* *Stamens monadelphous. Pods narrowly winged along the vexillar suture only.*

× Flowers in simple or almost simple racemes.

○ Pods lanceolate, acuminate or acute at both ends.

Erect tree; leaflets almost acute with a mucro . . . . . *D. robusta.*

Scandent shrub; leaflets notched . . . . . *D. scandens.*

○ ○ Pods oblong or orbicular with rounded ends. Scandent shrubs.

Glabrous; pod glabrous . . . . . *D. uliginosa.*

Rusty pubescent; pods pubescent or puberulous; leaflets in 1 or 2 pairs only . . . . . *D. elegans.*

As former, but leaflets usually in 4 pairs; flowers much larger . *D. elliptica.*

× × Racemes collected into panicles.

Scandent; glabrous pods sinuate-constricted between the seeds . *D. sinuata.*

* * *Stamens monadelphous or the vexillar one free. Pods more or less distinctly winged along both sutures.*

Scandent, glabrous . . . . . *D. amœna.*

1. **D. robusta,** Bth.—A tree (30—50+15—20+4—5), shedding leaves in H.S., the very young shoots slightly appressed rusty

pubescent; leaves unpaired-pinnate, about ½ a foot long; leaflets in 6-10 pairs, oblong or elliptical to ovate-oblong, a little unequal, blunt or nearly so, mucronate, on a ½ lin. long slender petiolule, 1-1½ in. long, entire, membranous, beneath glaucous and shortly appressed pubescent; flowers rather small, white, on capillary 2-3 lin. long puberulous pedicels, solitary or few together, forming a slightly puberulous long axillary raceme; calyx ample, puberulous, about a line deep; corolla glabrous, about 3 lin. long; ovary silky pubescent; pods linear-lanceolate, tapering in a very short stalk, incurved-acute, 1-4-seeded, flat, with a very narrow wing along the outer suture, brown, indistinctly appressed puberulous, ½-2 in. long.

Hab.—Frequent in the upper and lower mixed forests of Pegu.—Fl. Apr.—s.—l.—SS.=All.—*SiS.*

Remarks.—Wood red-brown, hard and close-grained, of a short coarse fibre, soon attacked by xylophages.

2. **D. scandens,** Bth.; H.f. Ind. Fl. ii. 240; Brand. For. Fl. 154.—*Mee-kyoung-nway.*—A large evergreen scandent shrub, the young parts pubescent; bark dark brown, white-lenticellate; leaves ⅓-½ ft. long, unpaired-pinnate, the rachis glabrous or puberulous; leaflets in 4-6 pairs, opposite or irregularly alternate, from oblong to oval-oblong, on a glabrescent or villous petiolule ½-1 lin. long, narrowed at the apex and notched, 1½ to 2½ in. long, entire, chartaceous, almost glabrous or more or less puberulous beneath; flowers rather small, pale rose-coloured, fragrant, on filiform 2-4 lin. long puberulous or pubescent pedicels, clustered by 3-6 and forming an ⅓-1 ft. long puberulous or rusty villous raceme in the axils of the leaves; calyx minutely rusty pubescent, wide, about 1½ lin. deep; corolla 3-4 lin. long, the wings a little hairy; ovary pilose; pods linear-lanceolate, acuminate, 1-4-seeded, flat, sessile, 1-3 in. long, glabrous or minutely puberulous, very narrowly winged along the outer suture only.

Hab.—Frequent all over Burma, from Chittagong, Prome, and Martaban down to Tenasserim and the Andamans, chiefly in alluvial lands in the tidal and swamp forests, but also entering the savannah forests.—Fl. June-July; Fr. C.S.—s: l.—SS.=All.

3. **D. uliginosa,** Bth.—A large evergreen scandent shrub, all parts quite glabrous; leaves unpaired-pinnate, up to ½ ft. long, glabrous; leaflets ovate to ovate-oblong, in 1-3 pairs, on a 2 lin. long petiolule, bluntish acuminate, 1½-2½ in. long, entire, chartaceous; flowers middling-sized, pale rose-coloured, on slender 1-2 lin. long pedicels, racemulose or clustered, forming a long glabrous raceme in the axils of the leaves; calyx wide, about a line deep, glabrous; corolla glabrous, about 4 lin. long; ovary slightly pubescent; pods obliquely oval or almost orbicular, rounded with a

stylose mucro, 1-2-seeded, flat, glabrous, 1-1½ in. long, narrowly winged along the outer suture.

HAB.—Frequent in the tidal forests and the low littoral lands, from Arracan down to Tenasserim and the Andamans.—Fl. March-May; Fr. R.S.—s.—SS.= All. Sal.

4. **D. elegans,** Bth.—A large scandent shrub, all softer younger parts more or less rusty pubescent; leaves unpaired-pinnate, ½-1 ft. long, while young rusty pubescent; leaflets in 1 or 2 pairs only, oblong to oblong-lanceolate, on a thick glabrous petiolule about a line long, bluntish, 3-5 in. long, chartaceous, entire, rusty pubescent, above or on both sides quite glabrescent; flowers white, middling-sized, on 3-4 lin. long slender rusty pubescent pedicels, solitary or few clustered or the lower ones racemulose, forming a very short rusty-villous raceme usually arising from above the scars of the leaves or from the leaf-axils themselves; calyx wide, rusty pubescent, about 1½ lin. deep; corolla glabrous, nearly 5 lin. long; ovary tawny villous; pods almost as in *D. uliginosa*, but rusty puberulous or pubescent, 1½ in. long by about an inch broad.

HAB.—Not unfrequent in the swamp forests of the Irrawaddi alluvium and along marshy streams of Tenasserim.—Fl. Febr.-March.—s : l.—SS.=All.

5. **D. elliptica,** Bth.—A large scandent shrub, the younger parts all rusty pubescent; leaves ½-1 ft. long, unpaired-pinnate, while young pubescent; leaflets in 4 to 5 pairs with an odd one, on a pubescent petiolule 2 lin. long, oblong to obovate-lanceolate, shortly and rather abruptly acuminate, 3 to 6 in. long, chartaceous, entire, glabrous above, more or less glabrescent beneath; flowers rather large, pinkish, on 2-3 lin. long rusty villous at apex bracteoled pedicels, peduncled-cymulose and forming an elongate rusty pubescent narrow panicle in the axils of the leaves or above the scars of the fallen ones; calyx ample, nearly 2 lin. deep, rusty pubescent; corolla ⅔ in. long, appressed tawny silk-hairy; ovary tawny villous; pods elliptic, compressed, rather acute, about 2 in. long by 1 broad, 1-2-seeded, puberulous and glabrescent, narrowly winged along the vexillar suture.

HAB.—Tenasserim.—Fl. March; Fr. Aug.

6. **D. sinuata,** Thw.—*Myouk-gong-nyin.*—A large scandent shrub, all parts glabrous; leaves up to a foot long, unpaired-pinnate, glabrous; leaflets in 2-3 pairs with an odd one, more or less ovate or broadly ovate, on a 2 lin. long petiolule, notched or almost notched-apiculate, 3-4 in. long, thin coriaceous, entire, glossy; flowers pale purplish, rather large, on 1-2 lin. long minutely puberulous pedicels, racemose and collected in a terminal narrow almost glabrous panicle; calyx wide, minutely velvety, about 2 lin. deep; corolla glabrous, about ½ an in. long; vexillar stamen free;

ovary pubescent; pods flat, elongate-oblong and often falcate, narrowed at the base, 1-4 in. long, acuminate, sinuate to almost moniliform-constricted between the 1-4 seeds, narrowly winged along the vexillar suture only.

HAB.—Not unfrequent in the beach and tidal forests of Pegu and Tenasserim.—Fr. Nov.-Dec.—l.—SS.=All. Aren. Sal.

7. **D. amœna,** Bth.—A scandent shrub, all parts quite glabrous; leaves unpaired-pinnate, up to ½ ft. long, glabrous; leaflets in 3-4 pairs, ovate to ovate-oblong, on a 2-3 lin. long petiolule, bluntish or notchedly acuminate, 1-2½ in. long, entire, thin coriaceous, beneath glaucous and the lateral nerves very thin and immersed; flowers rather small, on capillary 2-3 lin. long pedicels, clustered and forming a rather long glabrous raceme in the axils of the leaves or several crowded on short branchlets; calyx wide, nearly a lin. deep, glabrous; corolla about 3 lin. long, glabrous; ovary glabrous; pods very flat, more or less oblong, 2-4 in. long, 1-2-seeded, glabrous, along the vexillar suture very narrowly and almost obscurely, along the inner suture broadly (1-2 lin.), winged.

HAB.—Tenasserim.—Fr. March.

DALBERGIA, L.

Calyx-teeth short, the lowermost rather longer. Standard obovate or orbicular, the keel blunt. Stamens 10, or reduced to 9 in number, all united in a single slit or into 2 equal distinct sheaths; anthers didymous, opening at the top, erect. Ovary stalked, with one or few ovules; style incurved, with a terminal stigma. Pod thin and flat, obiong to linear-oblong or rarely falcate, indehiscent, the thin margins all wing-like expanded or rarely thickened. Seeds solitary or few and remote, very flat and reniform.—Trees or shrubs, often climbing, with unpaired-pinnate leaves, the leaflets usually alternate and without stipulets. Flowers small, in axillary or terminal dichotomous cymes or irregular panicles. Bracts and bractlets usually minute.

* *Erect shrubs or trees.*
  ○ Stamens united into a single slit sheath; flowers white.
    × Bractlets fallen before the expansion of the flowers.
Leaflets 3-7, almost orbicular to obovate, notched or blunt; all parts glabrous . . . . . *D. latifolia.*
Leaflets 7-11, more or less oblong, notched or blunt . . . *D. cultrata.*
    × × Bractlets black, short and broad, deciduous, but present during flowering.
Leaflets blunt or more or less notched with a mucro . . . *D. glauca.*
Leaflets acuminate . . . . . *D. ovata.*
  ○ ○ Stamens united into 2 separate sheaths; flowers white or purple.
    × Pods velvety; flowers purple . . . . *D. cana.*
    × × Pods quite glabrous.

† Leaflets apiculate, acute or acuminate, rather large.

Leaflets notchedly apiculate; panicles lax, puberulous; flowers white or purplish . . . . . *D. purpurea.*

Leaflets acute or shortly acuminate; panicles tomentose, compact; calyx glabrous; flowers white . . . . . *D. glomeriflora.*

† † Leaflets blunt or retuse, rather small.

Panicle rather compact; pedicels short or very short; flowers purple (?); leaves drying black . . . . . *D. nigrescens.*

Panicle very lax; pedicels slender; flowers white or purplish outside; leaves not nigrescent . . . . . *D. paniculata.*

* * *Climbing or scandent shrubs.*

○ Stamens united in 2 separate sheaths; leaflets blunt or notched.

Leaflets 11-13; inflorescence densely pubescent; bractlets minute *D. volubilis.*

Leaflets 17-21; inflorescence glabrous; bractlets small, but conspicuous . . . . . *D. stipulacea.*

○ ○ Stamens united in a single slit sheath.

× Leaflets in 5-7 pairs, retuse or blunt; inflorescence, etc., glabrous.

Flowers blue; panicle ample, terminal; leaflets more or less oblong *D. foliacea.*

Flowers white; panicle small, axillary; leaflets more or less obovate *D. rubiginosa.*

× × Leaflets in 11-41 pairs; inflorescence and young branchlets rusty pubescent.

Leaflets ⅓-½ in. long; panicle or cyme very short . . . *D. tamarindifolia.*

Leaflets 1-2 in. long; panicle ample . . . . . *D. velutina.*

1. **D. latifolia,** Roxb.; H.f. Ind. Fl. ii. 231; Bedd. Sylv. Madr. t. 24; Brand. For. Fl. 148.—A leaf-shedding tree (40—50 + 20—25 + 3—6), all parts glabrous; leaves unpaired-pinnate, 4-7 in. long, glabrous; leaflets alternate, in 1-3 pairs, almost orbicular to broadly obovate, on a 3-4 lin. long petiolule, 1-2 in. long and broad or broader, notched, entire, thin coriaceous, glabrous, glaucous-green; flowers small, white, strong-smelling, on slender 1-2 lin. long pedicels, forming a solitary or several quite glabrous short panicle-like cymes in the axils of the leaves or above the scars of the fallen ones; calyx pale-greenish, smooth, 1½ lin. long, the produced teeth acute, the others blunt; corolla glabrous, about 2 lin. long, the petals rather long-clawed; stamens 9, united in a single slit sheath; ovary glabrous; pods lanceolate or oblong-lanceolate, acuminate at both ends, tapering in a slender stalk, very flat, rigidly chartaceous, brown, smooth, slightly net-veined at the 1-3 seeds.

Hab.—Andamans (accord. Roxb.).

Remarks.—Heart-wood greenish or greyish black, often mottled or lighter veined, close-grained, takes a fine polish. Used in India extensively for cabinet-work, knees of vessels, agricultural implements, combs, etc., also in gun-carriage manufactories.

2. **D. cultrata,** Grah.; H.f. Ind. Fl. ii. 233.—*Yendike.*—A tree (25—70 + 10—40 + 2—9), leafless in H.S., the young shoots appressed silky pubescent; bark ½ an in. thick, rather smooth, with transverse short streaks; cut brown; leaves unpaired-pinnate, 5-6 in. long, while very young canescent or appressed tawny pubescent;

leaves alternate, in 3-5 pairs, elliptical to obovate-oblong, on a rather slender 1-2 lin. long petiolule, notched, 1-2 in. long, entire, thin coriaceous, glabrous; flowers small, white, or rarely pale rose-coloured, on capillary 2 to 3 lin. long pedicels, forming small dichotomous minutely pubescent cymes or cymose panicles in the axils of the young leaves or above the scars of the fallen ones; calyx puberulous or glabrous, nearly 1½ lin. long, the teeth rather large, acute; corolla glabrous, about 2 lin. long; petals fringed; stamens 9, united in a single slit sheath; ovary glabrous; pods very flat, oblong to linear-oblong, 1-2½ in. long, contracted in a 3-4 lin. long stalk, blunt, brown or greyish brown, glabrous, slightly net-veined at the 1-3 seeds.

Hab.—Common in all leaf-shedding forests, especially in the upper mixed savannah and Eng forests, all over Burma from Ava and Martaban down to Upper Tenasserim.—Fl. March-Apr.; Fr. C. S.—l.—SS. = ∞*SiS.*

Remarks.—Sap-wood pale-coloured, turning pale-brown, perishable; heart-wood extremely durable, blackish and ebony-like, sometimes white and red-streaked, close-grained, rather heavy, elastic, but cracky, □'=64 pd. Used for ploughs, bows, handles of dahs and spears. Exudes a red resin.

3. **D. glauca,** Wall.; H.f. Ind. Fl. ii. 231.—*Ma-da-ma.*—A tree 30—40+10—15+3—4), shedding leaves during H.S., all parts glabrous, the stem usually fluted and butressed; bark brownish grey, about 1½ lin. thick, longitudinally striate and minutely fissured; cut dry, brownish; leaves ½-1 ft. long, unpaired-pinnate, glabrous; leaflets in 3-4 pairs, alternate, obovate to elliptical, on a 2-3 lin. long petiolule, rounded or more or less retuse with a mucro, 2-4 in. long, entire, chartaceous, glabrous, somewhat glaucous beneath; flowers odorous, white, each supported by a broad black very deciduous bractlet, on very short but slender puberulous pedicels, cymose, forming an ample glabrous (the extreme branchings puberulous) panicle at the end of the branchlets; calyx 2 lin. long, glabrous, the teeth blunt; corolla 2 lin. long, glabrous, the petals long-clawed; stamens 9, in a single slit sheath; ovary glabrous; pods very flat, oblong to linear-oblong, 1½-2 in. long, narrowed in a short stalk, blunt, glabrous, brown or reddish brown, almost chartaceous, slightly net-veined at the 1 or 2 seeds.

Hab.—Frequent in the upper mixed forests of Pegu; less frequent in those of Martaban down to Tenasserim.—Fl. Jan.-Feb.; Fr. March-May.—s—l.—SS. =*SiS.* Metam.

4. **D. ovata,** Grah.; H.f. Ind. Fl. ii. 231.—*Ma-damah.*—A tree (25—35+10—15+2—3), shedding leaves during H.S., all parts quite glabrous; leaves unpaired-pinnate, glabrous, ½-¾ ft. long; leaflets alternate, ovate to obovate-oblong, on a 2-3 lin. long petiolule, acuminate, 2-3 in. long, entire, chartaceous, glabrous, a little glaucous beneath; flowers white, odorous, small, each supported by

a small black broad deciduous bractlet, on very short pubescent pedicels, cymose and forming a slightly appressed pubescent glabrescent panicle in the axils of the leaves or above the scars of the fallen ones and collected into a large panicle at the end of the branchlets; calyx glabrous, about 2 lin. long, the teeth rather long and bluntish; corolla glabrous, about 2 lin. long; stamens 9, in a single slit sheath; ovary glabrous; pods very flat, oblong to linear-oblong, blunt with or without a point, tapering in a short stalk, 1½-2½ in. long, coriaceous, glabrous, greyish brown, slightly net-veined at the 1 or 2 seeds.

Hab.—Frequent in the upper mixed forests of the Pegu Yomah, less so in those from Martaban down to Upper Tenasserim, especially along choungs.—Fl. Jan.-Febr.; Fr. Apr.-May.—s+l.—SS.=*SiS.* Metam.

5. **D. cana,** Grah.; H.f. Ind. Fl. ii. 237.—A tree (40—60+15—30+3—6), shedding leaves in H.S., the young parts slightly tawny pubescent, glabrescent; bark about ⅓ in. thick, grey, peeling off in little brittle irregular pieces; cut greenish-dark-brown; leaves unpaired-pinnate, 1-2 ft. long, while young slightly pubescent, soon glabrescent; leaflets in 7-9 pairs, alternate, on a pubescent glabrescent petiolule 1-1½ lin. long, oblong to linear-oblong, often somewhat unequal, shortly and rather abruptly acuminate, 2-2½ in. long, entire, chartaceous, when full grown glabrous, or slightly puberulous beneath; flowers small, purple, on capillary puberulous 1-2 lin. long pedicels, forming a lax puberulous short-peduncled panicle in the axils of the leaves or arising from above the scars of the fallen ones; calyx purple, glabrous or nearly so, about 2 lin. long, the teeth blunt; corolla glabrous, nearly 3 lin. long, the petals long-clawed; stamens 10, united in 2 separate sheaths; ovary pilose; pods flat, linear-oblong or linear, blunt, contracted in a short stalk, 3-4 in. long, tawny-velvety, indistinctly veined at the 3-1-seeds.

Hab.—Frequent in the tropical forests, especially along choungs, of the eastern slopes of the Pegu Yomah, and still more frequent from Martaban down to Tenasserim.—Fl. March; Fr. C. S.—s.—SS.=SiS. Metam.

Remarks.—Wood white, turning brownish, rather heavy, of a very coarse fibre, soon attacked by xylophages.

6. **D. purpurea,** Wall.; H.f. Ind. Fl. ii. 235.—*Thit-pote* or *thit-poh.*—A tree (40—60+15—20+5—6), leafless in H.S., all parts glabrous; leaves unpaired-pinnate, ⅔-1½ ft. long, the young rachis a little puberulous; leaflets usually in 4 pairs, alternate, obovate-oblong to oblong, on an ½-1 lin. long, puberulous, glabrescent petiolule, apiculate or blunt, 2-4 in. long, entire, thin coriaceous, glabrous; flowers small, pale purplish or almost white, on slender puberulous pedicels up to a line long, cymose, forming purplish coloured minutely puberulous glabrescent panicles, rather crowdedly arising from the short shoots or branchlets; calyx purple,

minutely puberulous, more than a line long, the teeth blunt; corolla glabrous, more than 3 lin. long, the petals rather long-clawed; ovary pubescent; stamens 10, united in 2 separate sheaths; pods flat, oblong-lanceolate, tapering in a stalk, bluntish, 3-3½ in. long, 1-seeded, coriaceous, glabrous, brown, obsoletely veined at the seed.

Hab.—Common in all mixed forests from Pegu and Martaban down to Upper Tenasserim, up to 3,500 ft. elevation.—Fl. Febr.-March; Fr. C. S.—l.—SS.=∞ *SiS.*

Remarks.—Sap-wood light, not much used; heart-wood black and ebony-like.

7. **D. glomeriflora,** Kz.; H.f. Ind. Fl. ii. 236.—A tree (30—40 + 10—20 + 4—5), leafless in H.S., the young shoots tawny tomentose; leaves while very young tomentose, turning glabrous, unpaired-pinnate; leaflets in 3-4 pairs, alternate, ovate to elliptical and obovate, on a slightly pubescent petiolule 1-2 lin. long, acute, 2-2½ in. long, entire, thin coriaceous, glabrous above, beneath shortly and slightly pubescent; flowers small, white, on very short pedicels or almost sessile, densely crowded into head-like panicles terminating the young villous shoots or arising from above the scars of the fallen leaves; calyx about 1½ lin. long, glabrous, the teeth blunt; corolla glabrous, a little longer than the calyx, the petals very shortly clawed; stamens 10, united in 2 separate short sheaths; ovary glabrous.

Hab.—Rather rare in the upper mixed forests of the Prome Yomah at 1,000 to 2,000 ft. elevation.—Fl. March-Apr.—l.—SS.—CaS.

8. **D. paniculata,** Roxb.; H.f. Ind. Fl. ii. 236; Bedd. Sylv. Madr. 88; Brand. For. Fl. 150.—*Ta-pouk-pen.*—A tree (60—80 + 30—50 + 8—9), leafless in H.S., the young shoots slightly and shortly puberulous; bark about ½ in. thick, grey, peeling off in small convex flakes; leaves unpaired-pinnate, 3-6 in. long, the young rachis puberulous; leaflets in 4-6 pairs, oval to obovate-oblong, on a slender 1-1½ lin. long petiolule, retuse or blunt, 1-2 in. long, entire, thin chartaceous, glabrous; flowers small, white, often bluish outside, on slender puberulous pedicels about a line long, forming shortly puberulous dichotomously branched lax and spreading panicles arising from above the scars of the fallen leaves; calyx 1½ lin. long, appressed pubescent, the teeth acute; corolla glabrous, nearly 3 lin. long, rather long-clawed; stamens 10, united into 2 separate sheaths; ovary almost glabrous, the stalk pubescent; pods flat, oblong-lanceolate to oblong, blunt or bluntish, rather abruptly tapering in a 3-4 lin. long stalk, rigidly but thin coriaceous, glabrous, slightly net-veined at the 1-3 seeds.

Hab.- Frequent in mixed dry forests, occasionally entering the drier upper mixed forests, from Ava and Prome to Pegu.—Fl. March; Fr. May-June.—l.—SS. = *CaS.* SiS. (?)

Remarks.—Wood white, turning pale-yellowish, strong, compact. Good for common house-building.

9. **D. nigrescens,** Kz.—*Thitsa-nweng.*—A leaf-shedding tree (40—50+10—25+4—6), the shoots tawny pubescent, all softer parts turning black in drying; leaves unpaired-pinnate, the rachis tawny pubescent and more or less glabrescent; leaflets in 3 to 5 pairs with an odd one, on a line long pubescent petiolule, elliptical to oblong, alternate, ½-1½ in. long, rounded or almost retuse, chartaceous, glabrous when full grown; flowers small, blue (?), very shortly pedicelled or almost sessile, cymulose and forming dense rusty or tawny tomentose panicles at the end of the branches; calyx nearly 1½ lin. long, densely tawny pubescent, the teeth acute; corolla glabrous, 2 lin. long, the petals shortly clawed; stamens united into 2 separate sheaths.

Hab.—Frequent in the dry forests, especially the mixed ones, of Prome and Ava—l.— SS. = CaS.

** *Climbing or scandent shrubs.*

10. **D. volubilis,** Roxb.; H.f. Ind. Fl. ii. 235; Brand. For. Fl. 152. —A large spreading shrub, usually more or less scandent, all parts glabrous; leaves unpaired-pinnate, glabrous, ⅓-⅔ ft. long; leaflets in 5 to 6 pairs, alternate, elliptically to oval- and obovate-oblong, on a slender 2-1 lin. long petiolule, rounded or almost retuse with a minute mucro, ½-2 in. long or rarely longer, membranous or thin chartaceous, entire, glabrous, usually glaucous beneath; flowers pale-blue, small, on slender 1-2 lin. long rusty puberulous pedicels, cymose and forming a rusty or tawny tomentose spreading panicle at the ends of the branchlets; bracts at the insertion of the pedicels, small, rusty-tomentose; calyx about a lin. long, puberulous, the teeth rather broad and long, rather blunt; corolla glabrous, about 3 lin. long, the petals cuneate at base, the standard broad; stamens 10, united into 2 separate sheaths; ovary pubescent; pods flat, oblong, tapering in a short stalk, blunt, thin coriaceous, glabrous, brown, slightly net-veined at the usually solitary or rarely 2 seeds.

Hab.—Frequent in all mixed forests, especially the lower ones, all over Burma from Chittagong, Ava, and Martaban down to Upper Tenasserim.—Fl. Febr.-March; Fr. Apr.-May—l.—SS. = ∞.

11. **D. stipulacea,** Roxb.; H.f. Ind. Fl. ii. 237.—*Douk-ta-loung-nway.*—A large climbing shrub, the stems 2-4 in. thick, the young shoots more or less puberulous; bark brownish grey, longitudinally fissured, fibrous; leaves unpaired-pinnate, ½-¾ in. long, the young rachis usually puberulous; leaflets in 8 to 10 pairs,

alternate, from oblong to obovate-oblong, on a slender a line long petiolule, more or less retuse, rounded at the base, 1-2 in. long, entire, thin chartaceous, while young minutely appressed pubescent beneath, turning soon glabrous and somewhat glaucescent; flowers small, pale-blue, each supported by a pair of lanceolate bractlets a line long, on 1½ to 2 lin. long slender puberulous pedicels, racemose and forming peduncled slightly pubescent cymes arising laterally from the young shoots or above the scars of the fallen leaves; bracts rather persistent, about as long as the pedicels, lanceolate; calyx glabrous, about 1½ lin. long, the teeth blunt, those in front acute; corolla glabrous, about 3 lin. long, the standard broad, the petals shortly and broadly clawed; stamens 10, united into 2 separate sheaths; ovary glabrous; pods elongate-oblong, 2-3 in. long, blunt, contracted in a short stalk, coriaceous, glabrous, brown, 1 or rarely 2-seeded, the unripe ones flat and veined at the seeds, the full-grown ones somewhat medullary-thickened with the veination furrowed-immersed.

Hab.—Common all over Pegu and Martaban down to Tenasserim, occurring not only in the mixed and tropical forests, but ascending also into the drier hill forests, up to 3,500 ft. elevation.—Fl. Jan.-Febr.; Fr. C.S.—s: l.—SS.=∞.

12. **D. foliacea,** Wall.; H.f. Ind. Fl. ii. 232.—A large scandent shrub, all parts glabrous, or the young shoots slightly pubescent; leaves unpaired-pinnate, ⅓-½ ft. long; leaflets in 2-3 pairs, alternate, obovate to elliptically-oblong, on an 1 to 1½ lin. long petiolule, retuse and usually mucronate, 1½-2 in. long, entire, chartaceous, glabrous, or while young shortly appressed puberulous beneath; flowers small, almost sessile, supported by a pair of small bractlets, cymose and forming an ample minutely puberulous glabrescent panicle at the end of the branchlets; calyx minutely puberulous, 2 lin. long, the teeth rather long, buntish; corolla glabrous, about 2 lin. long, the petals long-clawed; stamens 9, united into a single slit sheath; ovary glabrous; pods 1-2-seeded, flat, oblong to elongate-oblong, acute or blunt, tapering in a short stalk, 1½-3 in. long, glabrous, brown, thin coriaceous, runcinnate-veined at the seeds.

Hab.—Not unfrequent along choungs in the upper mixed forests of the Pegu Yomah and Martaban down to Upper Tenasserim.—Fl. Jan.-Febr.; Fr. C.S.—s: l.—SS.=SiS. Metam.

13. **D. rubiginosa,** Roxb.; H.f. Ind. Fl. ii. 232.—A large scandent shrub, the very young branchlets shortly tawny pubescent; leaves unpaired-pinnate, 2½-3 in. long, the rachis glabrous; leaflets in 3 to 5 pairs with an odd one, alternate, obovate to obovate-oblong, rounded or emarginate, on a line long slender petiolule, about an in. long, entire, thinly but rigidly coriaceous, glabrous, much net-veined; flowers small, white, on very short puberulous pedicels, racemose

and forming a small shortly rusty or tawny pubescent panicle in the axils of the leaves; calyx about a line long, pubescent; corolla glabrous, about 3 lin. long; stamens united in a single slit sheath; ovary glabrous; pods flat, lanceolate to linear-lanceolate, tapering in a slender stalk, bluntish, 1½ to 2 in. long, 1-2-seeded, brown, glabrous, much veined round the seeds.

Hab.—Not unfrequent in the tropical forests on the Kambala toung Yomah.—SS.=probably decomposed CaS.

14. **D. tamarindifolia,** Roxb.; H.f. Ind. Fl. ii. 234.—A scandent shrub, the young parts more or less tawny pubescent; leaves unpaired-pinnate, 3-6 in. long, while young much pubescent; leaflets in 7 to 20 pairs, on a very short petiolule or almost sessile, oblong to almost rhomboid-oblong, unequal at the base, retuse, ½-¾ in. long, entire, membranous, when full grown glabrescent above and slightly appressed pubescent beneath; flowers small, white, supported by a pair of small villous bractlets, on very short pedicels or almost sessile, in cymes or short small rusty or tawny villous panicles in the axils of the leaves; bracts small, ovate; calyx slightly appressed pubescent, 1½ lin. long, the teeth short, 2 of them blunt, the rest acute; corolla glabrous, 2 lin. long; the petals very long-clawed; stamens 9 or 10, united in a single slit sheath; ovary glabrous; pods very flat, oblong to linear-oblong, 1-3-seeded, almost chartaceous, red-brown, glabrous, blunt or a little acute, narrowed in a slender but short stalk, 1-2 in. long, net-veined at the seeds.

Hab.—Not unfrequent in the jungles of the Andamans; also Tenasserim. —Fr. May-June.

15. **D. velutina,** Bth.; H.f. Ind. Fl. ii. 233.—A large climbing shrub, all softer parts rusty or tawny pubescent; stipules in young shoots conspicuous, ½ an in. long, linear to ovate, softly pubescent; leaves unpaired-pinnate, rusty or tawny pubescent, ⅓-⅔ ft. long; leaflets in 5-9 pairs, alternate, oblong, on a thick tomentose petiolule a line long, blunt or almost notched, 1-1½ in. long, membranous to chartaceous, entire, puberulous above, tawny pubescent beneath; flowers small, on short but slender pubescent pedicels, cymose, forming smaller or larger rusty or tawny tomentose panicles along the young shoots or from the axils of the young leaves or from above the scars of the fallen ones; calyx rusty pubescent, about ½ lin. long, the upper teeth blunt, the others acute; corolla glabrous, nearly 3 lin. long; the petals long-clawed; stamens 10, united into a single slit sheath; ovary glabrous; pods flat, elongate-oblong or oblong, usually 1- rarely 2-seeded, blunt, tapering in a very short stalk, 1½-2 in. long, glabrous, net-veined at the seeds.

Hab.—Frequent in the tropical forests, and ascending into the drier hill forests, from Pegu and Martaban down to Tenasserim, up to 4,000 ft. elevation. —Fl. March.—s: l.—SS.=Metam. Lat. p.

PTEROCARPUS, L.

Calyx turbinate-bell-shaped, with the base acute, often incurved 5-toothed, almost 2-lipped. Standard orbicular or broadly ovate, the wings obliquely obovate or oblong and almost conform with the keel-petals or longer, free or slightly connate. Stamens united in a single or 2 distinct sheaths with the vexillar one free or not; anthers versatile. Ovary sessile or stalked, with 2 to 6 ovules; style filiform with a minute terminal stigma. Pod compressed-winged all round, indehiscent, orbicular, ovate or oval-oblong, more or less oblique or falcate with a lateral or rarely terminal style. Seeds 1 or 2, separated by hard septa, oblong or almost reniform.—Trees, with pinnate leaves, the leaflets alternate or irregularly opposite, without stipulets. Flowers usually yellow, in racemes or racemose panicles. Bracts and bractlets small, deciduous.

Pods about an in. broad, also while young almost glabrous; calyx more glabrous . . . . . *P. Indicus.*
Pods about 1½-2 in. broad, when young densely velvety-pubescent; calyx rusty pubescent . . . . . *P. macrocarpus.*

1. **P. Indicus,** Willd.; H.f. Ind. Fl. ii. 238; Bedd. Sylv. Madr. t. 23.—*Pa-touk.*—A tree (50—80+20—50+5—9), leafless in H.S., the very young shoots slightly tawny pubescent; leaves unpaired-pinnate, ½-1 ft. long, while very young a little pubescent, soon quite glabrous; leaflets more or less ovate to elliptical, alternate, in 3-4 pairs, on a slender 1-2 lin. long glabrous petiolule, shortly and abruptly bluntish acuminate or apiculate, 2-3 in. long, entire, thin chartaceous, glabrous when full grown; flowers middling-sized, yellow, on a slender 2-3 lin. long puberulous or glabrescent pedicel, racemose, forming a simple axillary puberulous raceme or more usually collected in an axillary and terminal glabrescent panicle; calyx about 3 lin. long, tapering at the base and somewhat oblique, almost glabrous or puberulous; corolla nearly 4 lin. long, the petals crispate-undulate; stamens finally separating in 2 sheaths; ovary appressed pubescent; pods (also while young) glabrous, irregularly orbicular, unequally sinuate-notched at the base and shortly stalked, about an inch across each way, the stylous acumination above the basal sinus.

Hab.—Frequent in the upper mixed forests from Martaban down to Tenasserim and the Andamans; very rare along the eastern slopes of the Pegu Yomah.—Fl. May-June; Fr. July-Aug.—SS.=*Metam.* Lat. p. SiS.

Remarks.—Wood light-brown with lighter-coloured heart-wood, coarsely fibrous, but close-grained, narrowly streaked, heavy. Excellent for the solid Burmese cart-wheels. Yields gum-kino.

2. **P. macrocarpus,** Kz.; H.f. Ind. Fl. ii. 239.—*Pa-touk.*—A tree (30—50+10—25+5—6), leafless during H.S., the young

shoots more or less tawny pubescent; bark blackish grey, nearly an in. thick, rough, peeling off in small pieces; cut red, exuding a red resin; leaves unpaired-pinnate, ½-⅔ ft. long, the rachis rusty puberulous; leaflets from ovate to oblong, in 3 to 5 pairs, alternate, on a rusty pubescent 1-2 lin. long petiolule, shortly and bluntish acuminate, mucronate, 1½ to 2½ in. long, entire, thin coriaceous, while young tawny pubescent beneath and more or less glabrescent except on the nerves; flowers middling-sized, yellow, on tawny pubescent 3-4 lin. long pedicels, forming simple tawny pubescent racemes in the axils of the leaves; calyx densely rusty velvety, about 3 lin. long, somewhat obliquely narrowed at the base; corolla more than 3 lin. long, the petals undulate-crispate; stamens united in 2 separate bundles; ovary villous; pods while young greyish or tawny velvety pubescent and less so when fully ripe, irregularly orbicular, with the wing somewhat folded, 1½-2 in. broad, unequally sinuate-rounded at the base, the minute stylous point above the basal sinus.

Hab.—Frequent in the Eng and upper mixed forests of Martaban and Tenasserim, very rare in the dry forests of Prome District.—Fl. Apr-May; Fr. R.S.—l.—SS.=*Metam.*, Lat. CaS.

Remarks.—Sap-wood pale-brown, streaked, rather light, close-grained. Yields a red resin, a sort of gum-kino.

MILLETTIA, WA.

Calyx broad, truncate, or with short teeth or lobes, the 2 upper ones often united. Standard broad, usually reflexed; keel incurved, blunt. Stamens 10, all united in a sheath or the vexillary one free or cohering with the others from the middle; anthers uniform. Ovary sessile or rarely stalked, surrounded at the base with an angular or cup-shaped disk, several-ovuled; style inflexed with a small terminal stigma. Pods flat or convex, from woody to thin coriaceous, finally dehiscing into 2 valves. Seeds orbicular or reniform, not strophiolate.—Trees or shrubs, often climbing, with unpaired-pinnate leaves, the leaflets usually stipellate. Stipules small. Flowers in terminal racemes or panicles. Bracts and bractlets usually very deciduous.

* *Climbers or erect shrubs.*

× Standard auricled at the base on both sides of the claw. Stamens monadelphous.

○ Corolla glabrous.

Young shoots rusty-tomentose; corolla violet-purple; ovary quite glabrous . . . . . *M. leiogyna.*

○○ Corolla, at least the standard, velvety or silky pubescent outside.

\+ Leaflets blunt or apiculate, rarely shortly acuminate. Branches brown.

Flowers purple, in elongate racemes longer than the petiole; ripe pods glabrous . . . . . *M. extensa.*

Flowers white, in elongate racemes longer than the petiole; ripe pods brown tomentose . . . . . *M. macrophylla.*
Flowers rose-coloured, in simple racemes usually shorter than the petiole; leaflets blunt; pods tawny or brown tomentose . *M. fruticosa.*
+ + Leaflets glaucous beneath, long and caudate-acuminate; branches grey . . . . *M. caudata.*
× × Standard not auricled at the base.
+ Corolla, at least the standard, velvety or silky pubescent outside.
Pods rusty or tawny velvety; leaves silvery or coppery silky beneath . . . . . *M. sericea.*
Pods finely brown-velvety; leaves glabrous . . . . . *M. coerulea.*
+ + Corolla glabrous. Ovary pubescent or villous.
Leaves glabrous; flowers racemose, in terminal panicles . . *M. cinerea.*
Young shoots and under-surface of leaves pubescent; calyx broader than deep . . . . . *M. pachycarpa.*
As former, but glabrescent; flowers much smaller; calyx longer than wide . . . . . *M. monticola.*
Leaflets rather blunt, thinly appressed canescent beneath; pods obscurely grey-canescent . . . . . *M. cana.*
* * *Erect trees. Stamens usually monadelphous, rarely diadelphous.*
× Stamens monadelphous. Pods more or less woody or rigidly coriaceous. Seeds much compressed.
○ Valves of pod flat or slightly convex, without prominent edges.
Young parts and leaves slightly pubescent; corolla glabrous, lilac; pods appressed puberulous . . . . . *M. pulchra.*
Young parts slightly pubescent; corolla pubescent, lilac; pods glabrous . . . . . *M. Brandisiana.*
Young shoots silky pubescent; corolla glabrous, white; pods thick, lenticellate-rough . . . . . *M. leucantha.*
Glabrous; corolla glabrous, blue; pods thick, warted . . . *M. ovalifolia.*
○ ○ Valves of pod extended into prominent ledges or short wings.
Young shoots slightly pubescent; leaflets bluntish acuminate; racemes almost glabrous; flowers steel-blue; pods almost winged . . . . . *M. glaucescens.*
As former, but the racemes pubescent; flowers white . . . *M. pubinervis.*
Shortly tomentose, especially while young; leaflets rounded; flowers pale-blue; pods waved-winged . . . . . *M. tetraptera.*
× × Stamens diadelphous. Pods leathery, the valves very convex and torose, smooth. Seeds not compressed.
Glabrous; flowers dark-purple . . . . . *M. atropurpurea.*

* *Climbers or erect shrubs.*

1. **M. leiogyna,** Kz.; H.f. Ind. Fl. ii. 109.—A large leaf-shedding scandent shrub, with cylindrical arm-thick stems, the young shoots rusty-tomentose, the branches terete, minutely lenticellate; bark ⅓ in. thick, roughish, fissured, blackish; cut red; leaves (very young) brown tomentose, unpaired-pinnate; leaflets in 4-6 pairs with an odd one; flowers rather large, violet, with the standard yellow in centre, on 2-3 lin. long, nodding, velvety pedicels, in 4-5 in. long brown tomentose racemes arising from short lateral branches or growing out into an ample lateral panicle; calyx

broader than long, 2-2½ lin. deep, tawny velvety, obsoletely toothed, the anterior tooth a little prolonged; corolla glabrous, the standard ½ an in. long, notched; ovary smooth; very young pods linear, smooth, terminating in a long subulate genuflexed point.

Hab.—Rare in the upper mixed forests of Toukyeghat, east of Tounghoo, Martaban.—Fl. Apr.—l.—SS. = Metam.

Remarks.—Wood rather heavy, yellowish, turning light-brown, coarsely fibrous, but rather close-grained, tolerably soft. Yields a red resin.

2. **M. extensa,** Bth.; H.f. Ind. Fl. ii. 109.—*Da-ma-gnai-nway.*—A large scandent shrub, the softer younger parts tawny or rusty velvety-pubescent, the branchlets usually minutely warted; leaves unpaired-pinnate, ½-1 ft. long, the rachis glabrescent; leaflets in 4-3 pairs, on a strong glabrescent petiolule 2 lin. long, ovate to elliptically oblong, bluntish apiculate to bluntish, 3-4 in. long, entire, rigidly chartaceous, while young on both sides thinly pubescent, finally turning glabrous above and slightly and minutely pubescent beneath; flowers rather small, reddish-lilac, on 1-2 lin. long velvety pedicels, solitary and clustered, forming tawny velvety 4-6 in. long racemes several or many together arising from the thick, usually short, scaly, lateral branchlets; calyx tawny velvety, about 2 lin. deep, broader than long, obsoletely and broadly toothed; standard about ⅓ in. long, notched, silky pubescent outside; ovary and young fruits tawny pubescent; pods linear-oblong, abruptly incurved-pointed, flat, 4-5 in. long, a little thickened along the sutures, when ripe quite glabrous.

Hab.—Frequent all over Burma, from Ava and Martaban down to Tenasserim, in all leaf-shedding forests up to 2,000 ft. elevation.—Fl. March-Apr.; Fr. C.S.—l.—SS.=∞.

3. **M. fruticosa,** Bth.; H.f. Ind. Fl. ii. 109.—A low scandent shrub, the branchlets pubescent; leaves long-petioled, ½-1 ft. long; leaflets in 4-5 pairs with an odd one, oblanceolate-oblong to oblong, 4-6 in. long, blunt or bluntish, glabrous above, thinly silk-hairy beneath; flowers purple, almost sessile, in dense short axillary racemes usually shorter than the petiole and sometimes collected in a terminal panicle; calyx 1½ lin. deep, densely silk-hairy, subtended by minute ovate bracts and bractlets; corolla ¾ in. long, rose-coloured, the standard densely silk-hairy; pod linear-oblong, woody, 2½-3½ in. long, silk-hairy when young.

Hab.—Pegu (accord. to Baker).

4. **M. caudata,** Bak. in H.f. Ind. Fl. ii. 109.—A low scandent or creeping shrub, all parts glabrous or nearly so; stipulets minute; leaflets in 3-4 pairs with an odd one, oblong to lanceolate, 4-6 in. long, long and more or less caudate-acuminate, chartaceous, glabrous, glaucous beneath; flowers rose-coloured, pedicelled, in slender

axillary short-peduncled racemes; bracts very minute; calyx bell-shaped, 1½ lin. deep, obsoletely toothed, densely silk-hairy; corolla 3-4 lin. long, densely silk-hairy; pods linear, rigidly coriaceous, turgid, 3-4 in. long, glabrous.

HAB.—In the stony beds of Martaban, rare.

5. **M. cinerea,** Bth.; H.f. Ind. Fl. ii. 106.—A large scandent shrub, all parts glabrous, the branchlets smooth; leaves unpaired-pinnate, glabrous, about ½ ft. long, the stipulets small, subulate-acuminate, longer persistent; leaflets in 2, rarely in a single, pair with a jointed long petioled odd one, elliptical to ovate and elliptically ovate, on a lin. long petiolule, bluntish apiculate or rarely almost acuminate, 2-4 in. long, entire, chartaceous, glabrous and net-veined; flowers rather large, white, with the tips of keel and wings purple, on 2 lin. long tawny velvety pedicels, racemose and forming a greyish or tawny-greyish velvety spreading panicle at the end of the branchlets; calyx broader than long, nearly 2 lin. deep, 2-lipped, the anterior 3 teeth acuminate, the posterior two 2-lobed-connate; corolla silky pubescent, the standard ½ an in. long; ovary densely tawny villous; pods linear-lanceolate, incurved-acuminate, flat, with abruptly thickened sutures, 2-3 in. long, densely tawny velvety, several-seeded.

HAB.—Chittagong; Burma.—Fl. May.

6. **M. sericea,** WA.; H.f. Ind. Fl. ii. 104.—A large scandent shrub with terete arm-thick stems, the younger parts tawny or silvery appressed-pubescent; bark blackish grey, smooth; leaves unpaired-pinnate, 1-2 ft. long, the rachis minutely pubescent glabrescent; leaflets in 3 or 2 pairs with a longer jointed-petioled odd one, elliptically ovate to oblong-lanceolate, on a pubescent petiolule 2-3 lin. long, long and finely acuminate, 3-6 in. long, entire, chartaceous, glabrescent above, beneath more or less silvery appressed pubescent; flowers purple with the standard brownish outside, the wings rose-coloured and the keel whitish, rather small, on nodding 2-3 lin. long tawny velvety pedicels, clustered, arranged in a slender more or less puberulous somewhat pendulous 1-1½ ft. long raceme arising singly or rarely by pairs from above the scars of the fallen leaves; calyx a little oblique, about 2 lin. deep, tawny velvety pubescent, obsoletely sinuate-toothed; corolla silky pubescent, the standard ½ an in. long; ovary pubescent; pod linear-oblong, incurved-pointed, 2-3 in. long, flat, with abrupt sutures, densely and shortly rusty-tomentose or velvety, several-seeded.

HAB.—Rather frequent in the tropical forests of Martaban, east of Tounghoo; also Ava, Kakhyen hills.—Fl. Apr.-May.—s.—SS.=Metam.

7. **M. pachycarpa,** Bth.; H.f. Ind. Fl. ii. 106.—A very large scandent shrub, all softer parts covered with a short, soft, rusty-

brown tomentum, the branches warted; leaves unpaired-pinnate, ½-1½ ft. long, the rachis rusty-tomentose; leaflets in 5 to 6 pairs with an odd one, on a 1-2 lin. long tomentose petiolule, obovate-oblong to oblong, apiculate or bluntish and mucronate, rarely shortly acuminate, 3-5 in. long, entire, membranous, thin chartaceous, while young on both sides tawny or rusty pubescent or almost tomentose, glabrescent above; flowers rather large, pale-rose coloured on 2-3 lin. long tomentose nodding pedicels, clustered and forming 1-3 or rarely more ½-¾ ft. long rusty or tawny tomentose racemes arising from above the scars of the fallen leaves or from axillary short thick branchlets; calyx nearly 3 lin. deep, broader than long, shortly and densely tomentose, obsoletely sinuate-toothed, the anterior tooth a little produced; corolla glabrous, the standard ½ in. long or somewhat longer; ovary densely rusty-villous; pods oblong to linear-oblong (or if 1-seeded more or less oval), 2 to 6 in. long, acute, very thick-coriaceous and slightly sinuate between the 1-3 very large seeds, glabrous, brownish, lenticellate.

Hab.—Ava, Kakhyen hills.—Fl. Apr.

8. **M. monticola,** Kz.; H.f. Ind. Fl. ii. 106.—A large scandent leaf-shedding shrub, the shoots sparingly rusty-pubescent, glabrescent, the branches warted; young leaves (full-grown ones not seen) unpaired-pinnate; leaflets in 4-3 pairs with an odd one, petioluled, oblong, shortly acuminate, beneath on the nerves appressed tawny pubescent; flowers lazuli-blue, rather small, on 1-2 lin. long rusty-tomentose pedicels, clustered, and forming solitary 4-7 in. long shortly rusty tomentose racemes arising from above the scars of the fallen leaves; calyx sparingly rusty tomentose, 2-2½ lin. deep, longer than broad, obsoletely and broadly toothed, the anterior tooth a little produced; corolla glabrous, the standard about ½ in. long; ovary thinly rusty-pubescent.

Hab.—Rather rare in the stunted hill and pine forests of the Nattoung at and near the top, at 6,500 to 7,200 ft. elevation.—Fl. March.—l.—SS. = Metam.

9. **M. coerulea,** Bak. in H.f. Ind. Fl. ii. 107.—A woody climber, with glabrous branches; leaflets 7, stipellate, obovate-oblong, on ⅛-⅙ in. long petiolules, cuspidate, almost coriaceous, 4-6 in. long, glabrous; flowers very shortly pedicelled, densely fascicled, in close short-peduncled racemes in the axils of the leaves; calyx bell-shaped, a line long, faintly silky, nearly truncate; corolla 3 times longer than the calyx, the standard densely white-canescent on the back; stamens monadelphous; pods linear-oblong, 7-8 in. long by 1½-1¾ broad, flat, rather woody, recurved, densely brown-velvety-pubescent, tardily dehiscing.—(From Hooker's Ind. Flor.)

Hab.—Upper Tenasserim, at Phanœ.

10. **M. cana,** Bth. in H.f. Ind. Fl. ii. 105.—A climber, with grey-pubescent branches; leaf-rachis ½ ft. long, grey-pubescent; leaflets 7, without stipulets, oblong with the terminal one obovate, 2½-3 in. long, rather blunt, glabrous and rather shining above, beneath thinly matted with appressed grey hairs, on ⅛ in. long petiolules; buds densely crowded, very shortly pedicelled; bracts lanceolate, silk-hairy, as long as the calyx; calyx minute, densely brown-silk-hairy, the teeth deltoid, half as long as the tube; standard glabrous; pod flat, rigidly coriaceous, obscurely grey-canescent, 2-3 in. long by ¾-⅞ broad, early dehiscing.—(After Hooker's Ind. Fl.)

Hab.—Ava.

11. **M. pulchra,** Kz.; H.f. Ind. Fl. ii. 104.—*Thit-pagan.*—A tree, probably leaf-shedding, the young shoots tawny pubescent; leaves unpaired-pinnate, ⅓-½ ft. long, the young rachis tawny or coppery pubescent; stipulets subulate, longer persistent; leaflets in 7-10 pairs with a longer and jointedly petioluled odd one, oblong to oblong-lanceolate, on a puberulous glabrescent petiolule a line long, acute to shortly acuminate, 1-2 in. long, entire, membranous, turning chartaceous, beneath glaucescent and covered with a minute coppery or tawny appressed pubescence; flowers blue (?), on 2-3 lin. long tawny pubescent pedicels, clustered and forming tawny shortly pubescent 3-4 in. long racemes, arising solitary from the axils of the leaves of the young shoots or opposite to the terminal leaves; calyx nearly as broad as long, minutely appressed pubescent, about 1½ lin. deep, obsoletely sinuate-toothed; corolla glabrous, the standard nearly ½ an in. long; ovary densely silky pubescent; pods flat, linear-oblong, acuminate, coriaceous, almost torulose round the seeds, appressed puberulous.

Hab.—Ava hills.

12. **M. Brandisiana,** Kz.; H.f. Ind. Fl. ii. 108.—*Thit-pagan.*—A tree (40—60 + 15—30 + 4—6), leafless in H.S., all parts glabrous; the leaf-buds coppery or tawny pubescent; bark dark-grey, roughish; cut dry, reddish; leaves unpaired-pinnate, ½-1 ft. long, the young rachis glabrous or nearly so, the stipulets subulate, longer persistent; leaflets in 7 to 10 pairs, with a longer and jointedly petioluled odd one, oblong-lanceolate to ovate-oblong, on a line long puberulous petiolule, bluntish acuminate, 1½ to 2½ in. long, entire, while young membranous and slightly minutely pubescent beneath, afterwards rigidly but thinly coriaceous, glabrous and glaucous beneath; flowers steel-blue, rather large, on rather thick 2-3 lin. long glabrous pedicels, clustered, forming 4-8 in. long glabrous racemes along the young leafy or leafless shoots; calyx purple, glabrous, nearly as long as broad, about 2 lin. deep,

tomentose-fringed, the teeth conspicuous, the anterior one rather produced, the posterior ones short and broad-connate; corolla shortly silky pubescent, the standard nearly ½ an in. long; ovary appressed pubescent; pods obovate-oblong to oblong, usually more or less narrowed towards the base, very flat, firmly coriaceous, rather abruptly incurved-acuminate, 2-3 in. long, brown, smooth, 1-3-seeded, the sutures not thickened.

Hab.—Common in the upper mixed forests of the Pegu Yomah, rare in those of Prome.—Fl. March; Fr. Jan.-Febr.—l.—SS.=SiS.

Remarks.—Wood white, soft, considered valueless.

13. **M. leucantha,** Kz.—*Theng-weng* or *thin-win.*—(*M. pendula,* Bak.; H.f. Ind. Fl. ii. 105.)—A leaf-shedding tree (53—60 + 15—25 + 5—6), the young shoots silky pubescent, glabrescent; leaves unpaired-pinnate, ½-¾ ft. long, while young thinly silk-hairy beneath, turning quite glabrous, the stipulets subulate, stiff, long-persistent; leaflets from ovate to elliptical, usually in 3 pairs with a longer jointedly petioluled odd one, shortly and rather abruptly acuminate, on a puberulous glabrescent petiolule about 2 lin. long, 3-4 in. long, rigidly chartaceous, entire, when full grown quite glabrous, pale-coloured beneath; flowers rather large, pure white, on 2-3 lin. long greyish velvety pedicels, clustered and forming a solitary greyish pubescent rather erect 3-4 in. long raceme at the end of the short lateral branchlets opposite the terminal leaf or occasionally laterally from young shoots; calyx nearly as long as broad, greyish velvety, about 2½ lin. deep, the 3 lower teeth distinct, rather acute, the upper 2 united in a broadly ovate single one; corolla glabrous, the standard nearly ⅓ in. long, entire; ovary appressed silky pubescent; pods woody, oblong to ovate-oblong, acute, glabrous, lenticellate, rough, 1½-3 in. long, 1-3-seeded, the edges rounded, as in *Pongamia glabra;* seeds flat, brown.

Hab.—Frequent in the dry and open forests, less so in the upper mixed forests, all over Prome and the Pegu Yomah, up to 2,000 ft. elevation.—Fl. March-Apr.; Fr. Apr.-May.—l.—SS. = *CaS.* SiS. Lat., Dil.

Remarks.—Heart-wood black, tough, but rather small; used for cross-pieces of harrows, etc.

14. **M. ovalifolia,** Kz.; H.f. Ind. Fl. ii. 107.—A tree (40—50 + 10—15 + 4—5), leafless in H.S., all parts quite glabrous; leaves unpaired-pinnate, ⅓-½ ft. long, glabrous; leaflets ovate to elliptical and elliptically ovate, on a slender 1-2 lin. long petiolule, in 3 rarely 4 pairs, with a long and jointedly petioluled odd one, shortly acuminate, apiculate or rather bluntish, ½-1 in. long, thin chartaceous, entire, somewhat glaucescent beneath, finely net-veined; flowers steel-blue, rather small, on a capillary 2-3 lin. long pedicel, solitary or almost clustered, forming slender, glabrous, 2-3 in. long racemes arising solitary or several from the short young

branchlets; calyx purple, glabrous, broader than long, about a line deep, obsoletely toothed or almost truncate; corolla glabrous, the standard about ¼ in. long; ovary slightly appressed pubescent; pods linear-oblong, narrower towards the base, incurved-pointed, rather flat with rounded sutures, almost woody, pale-coloured, glabrous, covered with minute warts, 2-3 in. long, containing 2-3 seeds at about the middle.

Hab.—Frequent in the dry forests of Prome, and entering also the savannah forests.—Fl. Fr. March-Apr.—l.—SS.=*CaS.* All.

15. **M. glaucescens,** Kz.; H.f. Ind. Fl. ii. 107.—*Toung-ka-zaw.*—A tree (60—70 + 20—40 + 6—8), shedding leaves in H.S., all parts glabrous or usually the young shoots slightly greyish pubescent; bark rather smooth, ½ in. thick; cut yellowish; leaves unpaired-pinnate, ½-1 ft. long, glabrous or the rachis and petiolules slightly puberulous; leaflets elliptical to obovate-oblong and oblong-lanceolate, in 4-3 or occasionally only in 2 pairs with a longer and jointedly petioluled odd one, bluntish and rather abruptly acuminate or apiculate, on a slender 2-3 lin. long glabrescent petiolule, 3-4 in. long, entire, membranous, glabrous or somewhat puberulous on the midrib beneath, glaucescent beneath; flowers rather small, blue, on capillary puberulous or almost glabrous 3-4 lin. long pedicels, forming slender, glabrous, or puberulous racemes solitary at the end of the lateral short branchlets or almost crowded along young shoots; calyx broader than long, sparingly pubescent, about 1-1½ lin. deep, obsoletely and broadly toothed; corolla glabrous, the standard indistinctly notched, nearly ⅓ in. long; ovary appressed silk-hairy; pods oblong with a narrowed base, woody, incurved-pointed, flat, the sutures bordered with thick narrow wings turned upwards and therefore appearing almost 4-angular and winged, glabrous, sprinkled with corky fissured lenticels, 3-4 in. long and 2-3 lin. thick, 1-3-seeded.

Hab.—Common in the tropical and the moister upper mixed forests, especially along choungs, along the eastern slopes of the Pegu Yomah and in Martaban.—Fl. Apr.-May.; Fr. May-June.—s.—SS.=SiS. Metam.

Remarks.—Wood yellowish, turning light-brown, coarsely fibrous, but brittle and rather hard.

16. **M. pubinervis,** Kz.; H.f. Ind. Fl. ii. 106.—A leaf-shedding tree (20—25+10—12 + 1—2), the young shoots puberulous; leaves unpaired-pinnate, about ½ a foot long, the rachis puberulous; leaflets elliptically to obovate-oblong, on a thin puberulous petiolule ½-2 lin. long, in 3 to 4 pairs with an odd one, rather long but bluntish acuminate, 2-3 in. long, thin chartaceous, entire, beneath glaucescent and pubescent on the midrib; flowers rather small, dirty yellowish white, on capillary pubescent pedicels, solitary or

clustered, forming a slender yellowish pubescent 2½-3 in. long raceme arising solitary at the end of the branchlets opposite the leaf; calyx red, broader than long, about 1½ lin. deep, slightly pubescent, obsoletely sinuate-toothed; corolla glabrous, the standard more than ⅓ in. long; ovary appressed pubescent.

Hab.—Rather rare in the upper mixed forests of Martaban, east of Tounghoo.—Fl. Apr.—l.—SS.=Metam.

Remarks.—Wood white, coarsely fibrous, rather light, perishable.

17. **M. tetraptera,** Kz.; H.f. Ind. Fl. ii. 106.—A tree (40—50+15—20+5—6), shedding leaves in H.S., all softer parts shortly and softly pubescent; leaves unpaired-pinnate, ½-⅔ ft. long, while young softly and shortly tomentose; leaflets in 3 (rarely 2 or 1) pairs with a longer jointedly-petioluled odd one, obovate to elliptically-obovate, on a strong 1-2 lin. long tomentose petiolule, rounded or almost notched or rarely apiculate, 1-3 in. long and nearly as broad, entire, while young membranous and shortly greyish tomentose on both sides, finally rigidly chartaceous and glabrous above; flowers rather small, but showy, very pale lilac, on 2-3 lin. long densely pubescent pedicels, clustered and forming 3-4 in. long tawny or yellowish tomentose racemes along the young leafy shoots and terminal opposite the end-leaf; calyx broader than long, tomentose, about 1½ lin. deep, obsoletely sinuate-toothed or almost truncate; corolla glabrous, the standard about ⅓ in. long; ovary appressed pubescent; pods almost cuneate-oblong, narrowed into a sterile base, woody, incurved-pointed, 3-4 in. long, pale-coloured and smooth, the borders turned upwards into irregular thick woody waved wings, and thus the pod almost 4-winged, containing 1 or 2 seeds at the upper half.

Hab.—Frequent in the dry forests, especially the mixed ones, of Prome and Ava.—Fl. Apr.—l.—SS.=CaS.

18. **M. atropurpurea,** Bth.; H.f. Ind. Fl. ii. 108.—*Kway-tanyeng* or *tanyeng-nee.*—An evergreen tree (50—60+15—30+5—6), the leaf-buds whitish tomentose; bark about 3 lin. thick, grey, smooth, peeling off in thin small flakes; cut brown, with blood-red sap-wood exuding red resin; leaves unpaired-pinnate, glabrous, 1-1½ ft. long; leaflets in 3-4 pairs with a long jointedly petioluled odd one, ovate-oblong to oblong, on a thick 3-4 lin. long petiolule, shortly acuminate or apiculate, 3-5 in. long, entire, thin coriaceous, glossy; flowers rather large, bluish purple with a yellow blotch at the base of the standard, on very short pubescent pedicels or almost sessile, spiked or racemose, and forming a robust pale-coloured shortly pubescent panicle at the end of the branches; calyx smooth, purple, 2-3 lin. deep, oblique, obsoletely sinuate-toothed, the posterior tooth more developed; corolla glabrous, the standard nearly ½ an in. long;

ovary glabrous; pods coriaceous, purplish black, smooth, 2-4 in. long, obliquely obovate to oblong and torose, acute, containing 1 or 2 large elliptically oblong black seeds.

Hab.—Rather frequent in the tropical forests along the eastern and southern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Jan.-March; Fr. May-June.—s.—SS.=*Metam. Lat. p.* SiS.

Remarks.—Wood pale-coloured, turning brownish, rather heavy, coarsely fibrous and rather loose-grained, soon attacked by xylophages. Yields a red resin.

INDIGOFERA, L.

Calyx small, broad and oblique, the teeth or lobes almost equal, or the lower longer. Standard ovate or orbicular, sessile or constricted in a claw; wings oblong; keel-petals slightly cohering to the wings, erect, blunt or acuminate, at both sides laterally gibbous or spurred. Staminal tube thin, long-persistent, the vexillar stamen free from the base; anthers conform, the connective gland-like apiculate. Ovary sessile or nearly so, with 1 or 2 or more ovules; style glabrous, the capitate stigma often penicillate. Pod various, from globular to linear, septate within between the seeds. Seeds without strophiole, the radicle often club-shaped.—Herbs, shrubs, or rarely trees, with simple or digitate or pinnate leaves. Stipules small and almost adnate to the petiole; stipulets sometimes present. Flowers in axillary racemes or spikes. Bracts present or none.

* *Calyx deeply cleft, the lobes subulate-acuminate. Corolla about twice as long as the calyx* (all herbs or undershrubs).

* * *Calyx toothed, the teeth short, more or less acute. Corolla at least 3 times as long as the calyx, but usually much longer* (shrubs, rarely trees).

× Leaves simple or 3-foliolate.

Whole plant greyish from minute appressed stiff hairs; leaves 1-3 foliolate on the same plant; stipules very minute . . . *I. Brunoniana.*

Pubescence soft, tawny; leaves 1-foliolate; stipules about 2 lin. long . . . . . *I. caloneura.*

× × Leaves unpaired-pinnate.

○ Pods more or less 4-cornered, 1½-2 in. long; seeds cubical or 4-gonous.

Stipules 2-3 lin. long; pods minutely appressed pubescent . . *I. galegoides.*

Stipules minute, pods glabrous . . . . . *I. pulchella.*

○ ○ Pods terete, about an inch long, glabrous; seeds cylindrical; stipules minute . . *I. elliptica.*

1. **I. Brunoniana**, Grah.; H.f. Ind. Fl. ii. 93.—*Toung-mai-sain.*—An erect branched shrub or undershrub, 1-3 ft. high, all parts greyish from short stiff appressed hairs; stipules subulate, very minute; leaves 1- (or the lower ones occasionally pinnately 3-) -foliolate, on a canescent ½-1 in. long petiole; leaflets oblong to elliptically

oval, on a very short subulate-stipellate petiolule, rounded at the base, 1-4 in. long, blunt or rounded with a bristly point, membranous, on both sides thinly and shortly appressed stiff-hairy, beneath canescent; flowers middling-sized, rose-coloured, on short slender canescent pedicels subtended by a subulate bract, forming a longer or shorter peduncled many-flowered canescent raceme of the length of the leaves or somewhat longer; calyx short and broad, about a line deep, the teeth 3-angular, short; corolla nearly ½ an in. long; pods linear, about 1½ in. long, bluntish, 4-cornered, the apex turned upwards and conically acute, shortly appressed hispid, containing numerous dark-brown 4-cornered oblong seeds.

Hab.—Not unfrequent in the Eng forests of Prome, Pegu, and Martaban.—Fl. close of R.S.; Fr. C.S.—l.—SS.=Lat.

2. **I. caloneura,** Kz; H.f. Ind. Fl. ii. 93.—An erect, branched shrub, all parts shortly but softly tawny pubescent; stipules about 2 lin. long, linear-subulate, densely pubescent; leaves 1-foliolate, on a strong densely tawny pubescent petiole 3-4 lin. long; leaflets more or less elliptical, on a thick very short petiolule, rounded at both ends or retuse at the apex, mucronulate, 3-4 in. long, entire, chartaceous, glabrous above, beneath softly pubescent and glaucescent, the midrib, nerves, and veins strongly prominent and tawny pubescent; flowers rose-coloured (?), rather small, on 2 lin. long filiform puberulous pedicels subtended by a subulate rather long bract, forming a strong, pubescent, many-flowered raceme in the axils of the leaves and usually shorter than them; calyx short, but wide, hardly a line deep, the teeth 3-angular, acute; corolla about ⅓ in. long; ovary densely silky pubescent.

Hab.—Pegu.

3. **I. galegoides,** DC.; H.f. Ind. Fl. ii. 100.—*Taw-mai-yain.*—A large meagre shrub, sometimes growing out in a small tree 12-15 ft. high, the stem about an inch thick, the branches angular-lined, the shoots appressed pubescent; stipules filiform, 2-3 lin. long, deciduous; stipulets very minute subulate; leaves unpaired-pinnate, rather shortly petioled, ⅓-½ ft. long; leaflets in 7-10 pairs with a longer petioluled odd one, obovate-oblong to elliptical, on a line long slender petiolule, obtuse at the base, ½ to 1 in. long, rounded with a minute mucro, entire, membranous, thinly and shortly appressed pubescent on both sides, glaucescent beneath; flowers white with purple keel, middling-sized, on puberulous 1-1½ lin. long pedicels subtended by a minute subulate bract, forming a rather robust, many-flowered, slightly pubescent axillary raceme much shorter than the leaves; calyx short, but wide, hardly a line deep, canescent, the teeth short, 3-angular, acute; corolla about ⅓ in. long; pods linear, somewhat compressed-4-cornered, 1½ to 2 in. long, acuminate,

minutely appressed pubescent, blackish, containing many dark-brown 4-cornered oblong seeds.

HAB.—Not unfrequent in the open forests, ascending into the hill Eng forests, up to 3,000 ft. elevation, from Martaban to Tenasserim; also above Rangoon. —Fl. R.S.; Fr. C.S.—SS.=*Lat.* Metam. Arg.

4. **I. pulchella,** Roxb.; H.f. Ind. Fl. ii. 101; Bedd. Sylv. Madr. 85, t. 12, f. 1.; Brand. For. Fl. 136.—*Taw-mai-yain.*—A stout, branched shrub, sometimes growing out in a small tree with a short thick trunk, the shoots thinly pubescent; stipules subulate, very deciduous; leaves unpaired-pinnate, short-petioled, 3-6 in. long; leaflets in 8-12 pairs with an odd one, elliptical to oval-oblong, on a slender puberulous petiolule 1-1½ lin. long, rounded or blunt with a mucro, ½-¾ in. long, rarely longer, entire, firmly chartaceous, on both sides thinly and minutely appressed pubescent, beneath glaucescent; flowers middling-sized, rose-coloured, on short canescent pedicels, forming a short, canescent, sessile, many-flowered raceme in the axils of the leaves and shorter than them; bracts linear-lanceolate, acuminate, canescent, very deciduous; calyx canescent, short, but wide, about a line deep, the teeth 3-angular-acuminate; corolla about ⅓ in. long; pods linear, almost 4-cornered, 1½-2 in. long, straight, with the conical point straight or conspicuously turned upwards, glabrous, brown, containing many cubical dark-brown seeds.

HAB.—Not unfrequent in the dry and open, especially the Eng forests, from Ava and Prome down to Pegu and Martaban.—Fl. Fr. C. and H.S.—l.—SS.= Dil. CaS. Aren.

5. **I. elliptica,** Roxb.—An erect, stout, branched shrub, the shoots thinly and shortly appressed pubescent; stipules subulate, minute; leaves unpaired-pinnate, shortly petioled, 3-6 in. long; leaflets in 4 to 8 pairs with a longer petioluled odd one, elliptical to obovate, on a line long pubescent filiform petiolule, ½-1 in. long, rounded or rarely retuse with a mucro, entire, thin-membranous, on both sides very thinly and minutely appressed pubescent, pale-coloured or almost glaucescent beneath; flowers middling-sized, rose-coloured, on short canescent pedicels, forming a short, sessile, many-flowered greyish-pubescent raceme in the axils of the leaves and much shorter than them; bracts lanceolate, hoary, very deciduous; calyx about a line long, appressed pubescent, the teeth 3-angular, acute; corolla about ⅓ in. long; pods linear, obliquely acute, about an inch long, almost terete with pale-coloured prominent sutures, brown, glabrous, containing 6-10 blackish cylindrically oblong truncate seeds.

HAB.—Pegu, above Rangoon; and from Martaban down to Tenasserim.—Fr. C.S.

SESBANIA, Pers.

Calyx-tube broad, truncate, or the teeth or lobes nearly equal. Standard orbicular or ovate, spreading or reflexed; keel incurved, blunt or acuminate, the claws much longer than those of the other petals. Upper stamen free, geniculate near the base, the others united in a sheath, angular at base; anthers uniform or nearly so. Ovary with several ovules; style glabrous, with a small terminal stigma. Pod long and linear or nearly oblong, 2-valved or indehiscent, the endocarp continuous with spurious transverse partitions separating the seeds. Seeds not strophiolate.—Herbs or shrubs, rarely trees, with abruptly pinnate leaves. Stipules setaceous, very deciduous; stipulets minute or none. Flowers large or middling-sized in axillary racemes. Bracts and bractlets very rarely persistent during flowering.

× Flowers 2-3 in. long; standard acute or bluntish; small tree . . . . . *S. grandiflora.*
× × Flowers less than an inch long; standard broad, more or less notched.
○ Racemes drooping from the base already; small tree . *S. Ægyptiaca.*
○ ○ Racemes erect from the base, but often overhanging. Shrubby annuals
Pods rather convex on both sides, 1½-2 lin. broad; standard ½ an in. long; seeds cylindrical . . . . . *S. aculeata.*
Pods rather flat, 2-3 lin. broad, with a narrow border; standard ⅔ in. long; seeds more or less compressed-rhomboid . . *S. cochinchinensis.*

1. **S. grandiflora,** Pers.; H.f. Ind. Fl. ii. 115; Bedd. Sylv. Madr. 86; Brand. For. Fl. 137.—*Pouk-pan* or *pouk-hpyoo.*—An evergreen tree (15—25+8—9+1—2), all parts glabrous; leaves abruptly pinnate, about ½ a foot long or longer, glabrous and somewhat glaucous-green; leaflets in 15-5 pairs, more or less opposite, oblong or elliptical, blunt or almost notched and often mucronulate, on a slender 1 lin. long petiolule, 1-1½ in. long, entire, membranous; flowers large and showy, scarlet, white or variegated, on ½-1 in. long glabrous pedicels, forming a very short 2-5-flowered glabrous raceme in the axils of the leaves; calyx glabrous, about ½ an in. deep or deeper, shortly and broadly toothed; standard 2-2½ in. long, ovate, rather shorter than the other petals; keel much incurved, ending in a blunt beak; pods 1-1½ ft. long, linear, beaked, narrow and sterile at the base, rather flat and somewhat 4-cornered, glabrous; seeds pale-coloured.

Hab.—Cultivated all over Burma, and adjacent provinces and islands, in villages, native gardens, etc.—Fl. R.S.—SS. = ∞.

2. **S. Ægyptiaca,** Pers.; H.f. Ind. Fl. ii. 114; Bedd. Sylv. Madr. 86, t. 12, f. 3.; Brand. For. Fl. 137.—*Yay-tha-kyee.*—An evergreen (20—25+8—10+⅔—2½), all parts glabrous; leaves 3-4

in. long, abruptly pinnate and bristly terminated, glaucous-green; leaflets in 7-18 pairs, oblong to linear-oblong, blunt, with or without a minute mucro, ¼-¾ rarely 1 in. long, on a very short thin petiolule or almost sessile, entire, membranous; flowers rather small, yellow or yellow and purple motted, or the standard purple outside, on capillary 2-4 lin. long pedicels, forming a nodding, slender, loose raceme in the axils of the leaves and shorter than them; bracts and bractlets very deciduous; calyx broader than long, about 2-3 lin. deep, glabrous, conspicuously 5-nerved, the teeth broad, acute; standard nearly ½ an in. long, very broad and notched; keel much incurved, broad, blunt, with an acute basal angle; pods narrow-linear and often curved, 4-8 in. long, 1½-2 lin. broad, sharply beaked, glabrous, convex and often somewhat tumid; seeds pale-brown.

Hab.—Generally cultivated with the natives all over Burma.—Fl. Fr. Jan.-May.—SS.=∞.

Remarks.—Wood white, soft, light, fibrous, but rather close-grained. Said to furnish the best charcoal for gunpowder; good for children's toys, etc.

PRIOTROPIS, WA.

Calyx-lobes almost equal, free. Standard almost orbicular, with 2 callosities at the short claw, the wings obovate, shorter than the standard, the keel beaked. Stamens all united in a sheath slit on the back; anthers dimorphous, the small versatile ones alternating with the long basifix ones. Ovary stalked, with many ovules, the style much incurved, longitudinally bearded along the inner side towards the terminal stigma. Pod stalked, oblong, much compressed, 2-valved, continuous within. Seeds on filiform funicles.—Shrubs, with 3-foliolate leaves and yellow racemose flowers.

1. **P. cytisoides**, WA.—An erect, branched shrub, 4 to 6 ft. high, the branches and shoots minutely appressed pubescent; stipules minute, subulate; leaves 3-foliolate, on an 1-1½ in. long petiole; leaflets more or less lanceolate, acute at the base, on a very short pubescent petiolule, acuminate or acute with a mucro, 1-2 in. long, entire, membranous, glabrous above, beneath glaucescent and sparingly minutely appressed pubescent; flowers middling-sized, yellow, on slender pubescent 2-3 lin. long pedicels subtended by a reflexed linear-acuminate small bract, forming leaf-opposed and lateral almost sessile slightly pubescent racemes; calyx about 3-4 lin. long, minutely appressed pubescent, the lobes lanceolate, acuminate; corolla much larger; pods much compressed, obliquely oblong, at the unequal base contracted in a slender about 3 lin. long stalk, stylose-acuminate, glabrous, about 1-1¼ in. long, containing 1-3 pale-brown glossy seeds.

Hab.—Ava hills and Tenasserim.—Fl. Fr. ∞.

BUTEA, Roxb.

Calyx ample, the teeth or lobes short, the 2 upper ones united in a broad entire or notched lip. Standard ovate to orbicular, acute or blunt, recurved, without appendages; wings oblique or falcate, free or adhering to the keel; keel much incurved, acute or blunt, as long or shorter than the standard. Stamens diadelphous, the vexillary one free; anthers conform. Ovary sessile or stalked, with 2 ovules; style elongate, incurved, beardless, the stigma terminal, minute or truncate. Pod almost sessile or stalked, oblong or broadly linear, coriaceous, indehiscent, the lower sterile part wing-like dilated. Seed solitary, compressed, at or near the summit of the pod.—Trees or woody climbers, with pinnately 3-foliolate leaves. Stipules small, deciduous; stipulets present. Flowers large or small, in racemes or panicles. Bracts and bractlets narrow, deciduous.

× Corolla scarlet, an inch long or longer, silky pubescent. Keel and standard more or less acute.
○ Pod sessile; erect shrub . . . . . *B. minor.*
○ ○ Pod stalked.
Erect tree; pedicels twice the length of the calyx . . . *B. frondosa.*
Woody climber; pedicels 3 times the length of the calyx . . *B. superba.*
× × Corolla less than ½ in. long, white, glabrous. Keel and standard more or less blunt. Climbers.
Leaves large, silvery silk-hairy beneath; pod stalked . . . *B. parviflora.*
Leaves small, glabrous to the naked eye; pod sessile . . . *B. acuminata.*

1. **B. frondosa,** Roxb.; H.f. Ind. Fl. ii. 194; Bedd. Sylv. Madr. t. 176; Brand. For. Fl. 142.—*Pouk-pen.*—A tree (30—50 + 6—10 + 6—8), leafless during H.S., the young shoots silky pubescent; leaves pinnately 3-foliolate, on a 3-4 in. long petiole, while young appressed greyish pubescent; leaflets on a strong pubescent glabrescent petiolule 2 lin. long, the terminal one broadly obovate, the lateral ones unequally ovate, blunt or bluntish, mucronate, 3-5 in. long, entire, when full grown rigidly chartaceous, above glabrous or nearly so, beneath greyish puberulous or shortly and thinly tomentose, the net-veination copious and strong; flowers large and showy, orange-scarlet, on ½-1 in. long tawny tomentose pedicels, clustered and arranged into tomentose robust racemes arising from short often tubercle-like branchlets or young shoots; calyx rusty velvety-tomentose, broader than deep, about ½ an in. across; corolla nearly 1½ in. long, silky pubescent; ovary villous; pods oblong, often a little falcate, appressed silvery pubescent, 3-4 in. long, blunt or nearly so, on ½ an in. long stalk.

Hab.—Common in all leaf-shedding forests, especially in the savannah forests, all over Burma from Chittagong, Ava, and Martaban down to Tenasserim.—Fl. March-Apr.; Fr. Apr.-May.—l.—SS.=∞.

Remarks.—Wood white, rather light and rather strong. Little used besides for common house-building purposes. Yields a red, brittle, clear resin, a sort of gum-kino of commerce. Superior lac is found on the tree.

2. **B. superba,** Roxb.; H.f. Ind. Fl. ii. 195; Brand. For. Fl. 143.—*Pouk-nway.*—A large woody leaf-shedding climber, the young shoots silky pubescent; leaves pinnately 3-foliolate, on a 3-4 in. long petiole, while young greyish pubescent; leaflets on a thick 1-2 lin. long petiolule, the terminal one broadly obovate, the lateral ones obliquely oval, blunt or rounded, 4-8 in. long, entire, chartaceous, when full grown glabrous above and minutely pubescent beneath, the net-veination strong and prominent; flowers large and showy, scarlet, on 1-1½ in. long rusty-tomentose pedicels, clustered and forming shorter or longer robust tomentose racemes arising from short branchlets above the scars of the fallen leaves; calyx while young more cylindrical than in the preceding species, afterwards broader than deep, nearly ½ an in. across, tawny or rusty velvety-tomentose; corolla silky-pubescent outside, nearly 1½ in long; ovary tomentose; pod oblong, silvery silk-hairy, 3-4 in. long.

Hab.—Frequent in all mixed forests all over Burma from Pegu and Martaban down to Upper Tenasserim.—Fl. March-Apr.; Fr. May-June.—l.—SS.= ∞ *SiS.*

3. **B. parviflora,** Roxb. (*Spatholobus Roxburghii,* Bth.; Brand. For. Fl. 143; H.f. Ind. Fl. ii. 193.)—*Pouk-nway.*—A large woody climber, leafless in H.S., the stem as thick as a man's leg and much fluted, the younger parts appressed silk-hairy; leaves pinnately 3-foliolate, on a 2-3 in. long glabrescent petiole; leaflets large, on a thick 2-3 lin. long petiolule, ovate to ovate-oblong, the lateral ones very unequally so, 5-6 in. long, apiculate to bluntish, almost coriaceous, glabrous above, beneath densely and almost silvery puberulous; flowers small, white, on strong about a line long pedicels, usually by pairs, racemose, and forming larger or smaller greyish or yellowish tomentose panicles in the axils of the upper leaves or at the end of the branches; calyx more than 3 lin. long, minutely tawny or whitish tomentose, the lobes triangular-lanceolate; corolla about 3 lin. long, glabrous; pods rusty or tawny tomentose, on nearly an in. long stalk, oblong, 3-4 in. long, the wing-like sterile part rounded and waved, the outer suture straight and thickened.

Hab.—Common in all mixed forests, especially the upper ones entering also the tropical forests, from Chittagong, Pegu, and Martaban down to Tenasserim.—Fl. Febr.-Apr.; Fr. D.S.—l. and s: l. SS.= ∞.

4. **B. acuminata,** Wall. (*Spatholobus acuminatus,* Bth.; H.f. Ind. Fl. ii. 194).—A large woody leaf-shedding climber, the stem as thick as an arm, the shoots slightly appressed pubescent; leaves

pinnately 3-foliolate, on a slender 1½-2½ in. long glabrescent petiole; leaflets more or less oblong to elliptically oblong, on a 2 lin. long pubescent petiolule, longer or shorter and abruptly acuminate, 1½ to 2½ in. long, chartaceous, glabrous and glossy above, beneath, especially on the midrib, minutely and sparingly appressed puberulous or almost glabrous; flowers small, white, on slender 2-3 lin. long puberulous pedicels, fascicled-racemose and forming small slender greyish puberulous almost sessile panicles above the scars of the fallen leaves; calyx about 2 lin. long, puberulous, the lobes broad and blunt; pods sessile, tawny puberulous, especially along the thickened straight outer suture, oblong to linear-oblong, rounded at the base, 2 to nearly 3 in. long.

Hab.—Frequent in the tropical forests all over Pegu and Martaban down to Tenasserim.—Fl. Fr. H.S.—s : l.—SS.=SiS.—Metam.

ERYTHRINA, L.

Calyx bell-shaped or cylindrical, obliquely truncate or slit on the back, entire or toothed. Standard broad or long, erect or recurved, narrowed and without appendages at the base; wings short, minute, or none; keel short, the petals united or not. Stamens all united at the base, the vexillar one often free from the middle; anthers reniform. Ovary stalked, with several ovules; style subulate, with a small stigma. Pod stalked, linear-falcate or flat and dilated at the sterile base, often more or less contracted between the seeds, dehiscing along one or both sutures, the endocarp often pithy. Seeds not strophiolate.—Trees or rarely shrubs or tall herbs, often prickly armed, with 3-foliolate leaves, the leaflets entire to 3-lobed. Stipules small; stipulets usually gland-like. Flowers large and showy, in clusters of 2-3 from lateral nodes and forming terminal or axillary racemes. Bracts small or none.

* *Wings much longer than the calyx.*

○ Seeds 1-3, at the end of the wing-like dilated 2-valved sterile part of the butea-shaped pod.

Standard minutely velvety; keel-petals free at the base and at the summit . . . . . *E. holosericea.*

Standard glabrous; keel-petals connate, obcordate and shortly acuminate in the sinus; pod on a 1-2 in. long stalk . . *E. lithosperma.*

○○ Pods greyish-velvety, fertile from the base.

Pod flat, torulose, opening along the sinuate outer suture, the dorsal suture prominent and straight; seeds free, but usually separated by spurious spongy septa; glabrous, glaucous . *E. ovalifolia.*

Pods torulose or almost moniliform, dehiscing at both sutures; seeds enclosed in the continuous pithy-chartaceous indehiscent endocarp . . . . . *E. Indica.*

** *Wings minute, as long or shorter than the calyx. Pods follicle-like, opening along the ventral suture. Seeds free.*

Leaflets glabrous, acuminate; calyx spathaceous . . . *E. stricta.*
Leaflets more or less pubescent or puberulous beneath, blunt; calyx 2-lobed, spathaceous . . . . . *E. suberosa.*

1. **E. holosericea,** Kz.—A leaf-shedding tree, armed with short black sharp prickles, the young shoots mealy-puberulous; leaves 3-foliolate, on a 3-4 in. long petiole, glabrous, exactly agreeing with those of the following species, the stipulary glands large; leaflets more or less ovate, on a 2-3 lin. long petiolule, acuminate, 3-5 in. long, entire, chartaceous or membranous; flowers large, apparently scarlet with purple wings and keel, almost sessile, by 2-3 clustered and forming a tawny mealy-tomentose raceme; calyx shortly resupinate-spathaceous, brown-villous, tawny-silky within, 4-5 lin. long; standard nearly 1½ in. long, obovate-cuneate, blunt, minutely velvety, the wings falcate-oblong, blunt, about ⅓ as long, the keel about ¾ in. long, consisting of 2 obliquely oblong rather acute shortly clawed petals united along the median part and hence appearing 2-lobed; ovary shortly tawny villous.

Hab.—Pegu, Tharrawaddi district.

2. **E. lithosperma,** Miq.; H.f. Ind. Fl. ii. 190.—*Yea-kathit.*—A tree (50—60 + 20—30 + 4—6), leafless in H.S., the trunk and branches armed with short sharp prickles arising from pustules, the very young shoots mealy-puberulous; leaves 3-foliolate, on a 3-5 in. long petiole, the stipulary glands large; leaflets more or less ovate, the lateral ones somewhat obliquely so, on a strong 3-4 lin. long petiolule, acuminate, 4-5 in. long, entire, chartaceous, glabrous, pale-coloured beneath; flowers rather large, scarlet, with whitish wings and keel, almost sessile, clustered by 2-3 and forming a mealy-tomentose raceme arising from the axils of the upper young leaves at the end of the branchlets; calyx ample, tawny-velvety tomentose outside, silvery silky inside, 2-cleft, about 4 lin. long or somewhat longer; standard elliptically oblong with a short tapering base, blunt, 1-1¼ in. long, glabrous; keel about ⅓ as long, obversely and broadly cordate with a short acumen in the sinus; wings as long as the keel, narrowly cuneate-obovate; pods on a 1-2 in. long stalk, 4-5 in. long, chartaceous, glabrous, much flattened and dilated at the lower sterile half, the upper contracted part bearing 1-3 seeds, subulate-acuminate; seeds free, large, purplish brown.

Hab.—Common along streams in the hill savannah and upper mixed forests all over Pegu and Martaban.—Fl. Jan.-Febr.; Fr. March-Apr.—s.×l.—SS.= Metam. *SiS.*

Remarks.—Wood soft, yellowish.

3. **E. ovalifolia,** Roxb.; H.f. Ind. Fl. ii. 189; Bedd. Sylv. Madr. 88.—*Kone-kathit.*—A tree (40—50 + 15—20 + 3—4), shedding

leaves in H.S., the trunk and branches armed with sharp prickles arising from compressed woody tubercles, all parts glabrous; bark thin, covered with a brown membrane; cut greenish; leaves 3-foliolate, on a 2-3 in. long petiole, glabrous, the stipulary glands rather large, orbicular; leaflets oval to oblong-oval, on a strong 2-3 lin. long petiolule, blunt or bluntish, 2½-3½ in. long, entire, chartaceous, glabrous, glaucous beneath; flowers rather large, dull-purple, with the keel and wing bases greenish yellow, on 4-6 lin. long strong mealy-tomentose pedicels, by 2-3 clustered or solitary and collected in a robust tawny or greyish tomentose raceme arising at and near the end of the branchlets; calyx tawny velvety, shortly and reflexed-spathaceous, nearly ½ an in. long; standard broadly obovate, narrowed at the base, somewhat notched, about 1¼ in. long; wings obovate-oblong, ½ in. long; keel nearly ⅔ in. long; ovary tawny pubescent; pods about ½ ft. long, torulose, sinuate along the outer border, incurved-acuminate, indistinctly greyish puberulous, the inner suture strongly prominent; seeds oblong, purplish black, free, often separated by medullary septa.

Hab.—Common in the tidal forests and tidal savannahs, also in the beach jungles, of Chittagong, Arracan, and Lower Pegu; also met with in Tounghoo district along the Khaboung chg. near villages, here cultivated (?)—Fl. Febr.-March.—l.—SS.=All. *Sal.* Aren.

Remarks.—Wood white, light, very coarse and fibrous.

4. **E. Indica,** Lamk.; H.f. Ind. Fl. ii. 188; Bedd. Sylv. Madr. 87; Brand. For. Fl. 139.—*Penglay-kathit.*—A tree (50—60+10—15+5—?), leafless during H.S., the trunk and branches armed with short sharp prickles arising from woody tubercles, the very young shoots more or less mealy-puberulous; leaves 3-foliolate, on a 2-3 in. long petiole, the stipulary gland round, rather large; leaflets broadly ovate, the lateral ones somewhat obliquely so, on a 2-3 lin. long puberous glabrescent petiolule, 2-3 in. long and broad, bluntish acuminate, entire, membranous, glabrous, green; flowers rather large, purplish scarlet, on strong mealy-puberulous 2-4 lin. long pedicels, by 2-3 clustered and forming one or several lateral, stiff, strong, mealy-pubescent racemes at the end of the leafless thick branchlets; calyx spathaceous, fully ¾ in. long, glabrous, incrassately truncate at the tip, while young terminated by 2 subulate appendages; standard ovate-lanceolate, narrowed at the base, acute, nearly 1½ in. long; wings and keel obovate, only ½ an in. long; ovary tawny tomentose; pods ½-1 ft. long, much curved and torulose, or by abortion of seeds almost moniliform, thin coriaceous, glabrous; seeds large, reddish or purplish, all enclosed in the continuous medullary-papery endocarp.

Hab.—Frequent in the beach forests along the shores from Chittagong down to Tenasserim and the Andamans.—Fl. March; Fr. June-Sept.—l.—SS.=Aren All. Sal.

Remarks.—Wood soft and white, loose-grained, very light, soon attacked by xylophages. It is the múchi wood of Madras, employed for children's toys, boxes, etc. Said to yield lac.

Note.—Strange enough, this sea-shore tree scantily re-occurs in the dry forests of the Prome district. I have not examined the respective localities, but suspect that there are brine wells or limestone in the vicinity.

5. **E. stricta,** Roxb.; H.f. Ind. Fl. ii. 189; Bedd. Sylv. Madr. t. 175.—*Toung-kathit.*—A tree (40—60+15—25+4—5), leafless during H.S., the trunk and branches armed with sharp prickles arising from woody lamellate tubercles, the young shoots minutely puberulous; leaves 3-foliolate, on a 2-4 in. long petiole, the stipulary glands rather small; leaflets broadly ovate, the lateral ones somewhat obliquely so, on a 2-3 lin. long petiolule, bluntish acuminate, 2-4 in. long and broad, entire, membranous, glabrous or indistinctly puberulous and glaucous beneath; flowers scarlet, with the wings and keel whitish, rather large, on rather thick 3-4 lin. long puberulous pedicels, by 2-3 clustered and forming tawny, mealy-pubescent, glabrescent, robust racemes arising usually several together at the end of the thick leafless branchlets; calyx glabrous, resupinate-spathaceous, 4-5 lin. long, at the base constricted in a conical tube, almost acute; standard linear-lanceolate with a short narrowed base, bluntish, about 1½ in. long; keel ovate-lanceolate, half as long; wings about 2 lin. long, falcate-lanceolate, acuminate; pods follicular-lanceolate, 2½-3 in. long, chartaceous, glabrous, acuminate at both ends; seeds free, 1-3, brown.

Hab.—Frequent in the upper mixed forests of the Pegu Yomah and Prome, rare in Martaban, up to 2,000 ft. elevation.—Fl. March-Apr.; Fr. May-June.—l.—SS.=SiS. Metam.

Remarks.—Wood white, soft.

6. **E. suberosa,** Roxb.; H.f. Ind. Fl. ii. 189; Bedd. Sylv. Madr. 87; Brand. For. Fl. 140.—A tree (40—50+20—30+3—6), shedding leaves in H.S., the branchlets sparingly armed with short sharp prickles, the young shoots mealy-tomentose; bark very thick, quite uneven and deeply longitudinally cracked, pale-coloured, the crakes laminate; leaves 3-foliolate, on a glabrescent 4-5 in. long petiole, the stipulary glands conspicuous; leaflets ample, 4-7 in. broad, and the terminal rounded one usually shorter than broad, broadly ovate, the lateral ones somewhat obliquely so, sinuate-truncate at the base, on a strong petiolule 3-4 lin. long, blunt, entire, chartaceous, beneath glaucous and minutely appressed puberulous or pubescent, the net-veination strongly prominent; flowers scarlet, rather large, on 3-4 lin. long floccose-mealy pedicels, solitary or almost clustered, forming several tawny, mealy-tomentose, robust racemes at the end of the leafless branchlets; calyx ample, 4-5 lin. long, slightly mealy outside, silvery silky inside, glabrescent, at the base constricted

in a conical short tube, 2-lobed, the lobes broad, somewhat acute, or the posterior broader one sometimes shortly 2-cleft; standard linear-lanceolate, bluntish, shortly tapering at the base, about 1¼ in. long; keel ½ an in. long, ovate, acute; wings 2-2½ lin. long, rhomboid-cuneate, acute, almost cohering; ovary tawny-villous; pods 3 in. long, follicular-lanceolate, at both ends acuminate, glabrous; seeds 2-3, free, pale-brown.

HAB.—Not unfrequent in the drier upper mixed forests of the Pegu Yomah, up to 2,000 ft. elevation.—Fl. March-Apr.—1.—SS.=SiS.

FLEMINGIA, Roxb.

Calyx-lobes almost equal or the lowermost longer, free, often falcate. Standard ovate to orbicular, at the base furnished with inflexed auricles; wings obliquely obovate or oblong, sometimes adhering to the rather straight or incurved acute or blunt keel. Stamens united in a sheath, the vexillar one free; anthers uniform. Ovary sessile or nearly so, with 2 ovules; style filiform or slightly thickened at the apex, with a small terminal stigma. Pod short, oblique, often turgid, 2-valved, continuous within. Seeds not strophiolate.—Erect or rarely prostrate shrubs or undershrubs, with digitately 3- or 1-foliolate leaves. Stipules striate, usually deciduous; stipulets none. Flowers in spike-like racemes or short panicles. Bracts large and persistent, or smaller, persistent or deciduous; bractlets none.

* *Capsules exserted from the calyx, usually* 2*-seeded.*

× Racemes one-sided, the upper ones collected in a panicle. Floral bracts large, leafy, complicate, persistent. Leaves 1-foliolate.

○ Floral bracts glabrous; corolla yellowish, ⅓ in. long — *F. chappar.*

○ ○ Floral bracts puberulous or pubescent.

Stipules not above 3 lin. long, rather deciduous; bracts rounded and obsoletely pointed, not ciliate; corolla about 3 lin. long, white or yellowish . . . . . — *F. strobilifera.*

Stipules stiff-subulate, up to ½ an in. long; bracts more or less retuse, ciliate; corolla purplish, about 2 lin. long . . . — *F. bracteata.*

× × Racemes spike-like, solitary or clustered, or in panicles, rarely reduced to heads.

○ Leaves 1-3-foliolate.

Leaves simple; bracts small, persistent . . . . . — *F. paniculata.*

Leaves 3-foliolate; racemes and calyx glandular; bracts subulate, very deciduous . . . . . — *F. lineata.*

○ ○ Leaves digitately 3-foliolate. Spikes while young densely imbricate-bracted, the bracts deciduous long before opening of the flowers, or rarely persistent.

\+ Low shrubs with a subterranean woody trunk.

Racemes small, silvery silky; calyx-teeth linear subulate, 2½-3 lin. long; petiole winged, about ⅔-1 inch long . . . . . — *F. sericans.*

Racemes rather slender and lax; flowers almost sessile; calyx 2 lin. long or somewhat longer, the teeth falcate-lanceolate,

the lowermost one barely longer than the rest; petiole winged, 1-2 in. long . . . . . *F. ferruginea.*

++ Well-developed undershrubs.

Petiole usually not winged; racemes dense, usually clustered and shorter than the petiole, greyish silk-hairy; bracts linear-lanceolate, subulate-acuminate, about 4 lin. long; calyx 3¼ lin. long, the lobes linear, subulate-acuminate, the lowermost much longer; corolla 3½ lin. long, purplish, with a flesh-coloured purplish-streaked standard . . . . . *F. congesta.*

As preceding, petiole narrowly winged; racemes appressed tawny pubescent, much shorter than the petiole; calyx 2 lin. long, the lobes linear-subulate; corolla slightly longer; pods puberulous and often densely glandular-resinous . . . *F. prostrata.*

Petiole narrowly winged; racemes rather lax, greyish silk-hairy; calyx 3 lin. long, the lobes subulate; bracts ovate-lanceolate, cuspidate; corolla 3 lin. long, rose-coloured with greenish keel; pods puberulous . . . . . *F. semialata.*

Bracts and calyx appressedly brown or golden silk-hairy, the latter ½ in. long, the lobes subulate and the lowermost twice as long; corolla ½ in. long, white, with rose-coloured wings; petiole narrowly winged . . . . . *F. latifolia.*

Bracts scarious and stiff, very much longer than the buds, the lower sheathing ones up to 2 in. long, silvery silk-hairy; calyx-lobes linear, acuminate, the lowermost one doubly longer; corolla nearly ⅓ in. long; pods minutely appressed puberulous; petiole narrowly winged . . . . . *F. stricta.*

** *Capsules enclosed in the calyx, usually* 1*-seeded*; flower heads involucred by the outer large bracts . . *F. capitata.*

1. **Fl. chappar,** Ham.; H.f. Ind. Fl. ii. 227.—A shrub, 3-4 ft. high, the branches terete, appressed tawny pubescent; leaves 1-foliolate, cordate-orbicular, on an 1½ in. long petiole, shortly and rather abruptly acuminate, 2-3 in. long and as broad or sometimes broader, 3- to almost 5-nerved at the base, indistinctly velvety above, minutely tawny pubescent beneath; flowers small, yellowish, very shortly pedicelled, forming a small rusty pubescent cluster perfectly enclosed in the complicate large floral bracts and forming axillary and terminal large-bracted racemes; bracts orbicular-reniform, retuse with a mucro, ½ an in. long, scarious and nerved, glabrous; calyx about 2½ lin. long, puberulous, the lobes lanceolate, acuminate; corolla glabrous, ⅓ in. long.

Hab.—Frequent in the Eng and dry forests of Pegu, Martaban, Prome and Ava.—Fl. C.S.; Fr. H.S.—l.—SS.=Dil.; CaS. Metam.

2. **F. strobilifera,** Ait.; H.f. Ind. Fl. ii. 227.—A branched shrub, very variable in size (1-4 ft. high), the branches slightly angular, shortly tawny pubescent; stipules lanceolate, about 3 lin. long, more or less deciduous; leaves 1-foliolate, on a 2-3 lin. long pubescent petiole, lanceolate to ovate-lanceolate, acuminate or acute, from 2-4 in. long, usually 6-nerved at the rounded or obtuse base, thinly and minutely appressed pubescent or pilose, especially along the nerves; flowers small, yellowish or white, in small tawny pubescent fascicles in the axils of the large complicate bracts, the

latter orbicular-reniform, usually rounded or obsoletely acute, ½-⅔ in. long, sparingly and softly hairy, but not ciliate, membranous and nerved; calyx 2 lin. long, puberulous, the lobes lanceolate, acuminate; corolla glabrous, about 3 lin. long or somewhat longer; pods oblong to ovoid, ¼-⅓ in. long, 1- or 2-seeded, thinly pubescent.

Hab.—Common in all leaf-shedding forests and savannahs, all over Burma from Chittagong and Martaban down to Tenasserim.—Fl. R. S. & C.S.; Fr. H.S.—l.—SS. = ∞.

3. **F. bracteata,** Wight.—An erect branched shrub, 1 to 3 ft. high, the branches almost terete, tawny pubescent; stipules stiff, subulate, striate, up to ½ in. long, persistent; leaves 1-foliolate, on a strong pubescent petiole 2-3 lin. long, ovate to ovate- and linear-lanceolate, more or less acuminate, 2-4 in. long, almost glabrous above, beneath, especially along the nerves, thinly and shortly pubescent; flowers minute, pale-purple, very shortly pedicelled, solitary or in poor fascicles in the axils of the large complicate bracts, forming tawny pubescent large bracted racemes in the axils of the leaves and at the end of the branchlets; bracts broadly reniform, more or less retuse with a mucro, thinly hairy and distinctly ciliate, chartaceous and nerved, ½ to ⅔ in. long; calyx a line long or a little longer, velvety-puberulous, the lobes lanceolate, acute; corolla glabrous, 2 lin. long; pods about 3 lin. long, ovoid, puberulous.

Hab.—Frequent in all leaf-shedding forests, especially the lower mixed and savannah ones, all over Burma from Ava and Martaban down to Pegu.—Fl. close of R.S. & C.S.; Fr. H.S.—l.—SS. = ∞.

4. **Fl. paniculata,** Wall.; Hf. Ind. Fl. ii. 227.—An erect branched shrub of a few feet in height, the branches terete, sparingly pubescent; leaves 1-foliolate, on a slightly pubescent petiole varying in length from ¾ to ¼ in., ovate, more or less cordate at the 3- or 5-nerved base, shortly acuminate, thin chartaceous, 2-3 in. long, sparingly and shortly pubescent along the nerves, especially beneath; flowers small, purplish (?), on puberulous about a line long pedicels, forming a pilose, slender, short, sparingly branched, almost sessile panicle at the end of the branches or in the axils of the upper leaves; bracts about 2 lin. long, ovate-lanceolate, pilose, deciduous; calyx nearly 2 lin. long, pubescent, the lobes linear-acuminate; corolla glabrous, 3 lin. long or longer; pods oblong, ½ an in. long, puberulous, usually 2-seeded.

Hab.—Upper Tenasserim.—Fl. C.S.

5. **F. lineata,** Roxb.; H.f. Ind. Fl. ii. 228.—An erect branched shrub, 1 to 4 ft. high, the branchlets almost terete and shortly but thinly pubescent; leaves digitately 3-foliolate, on a slightly pubescent petiole ⅔-⅕ in. long; leaflets lanceolate, the lateral ones somewhat obliquely so, the terminal more obovate-lanceolate, very

shortly petioluled, more or less 3-plinerved at the base, acute, 1-2 in. long, almost glabrous above, beneath, especially along the nerves, appressed pubescent and conspicuously red-resinous-dotted; flowers small, whitish, with a purple keel and rose-coloured wings, on a line long pedicels, forming a slender glandular-pubescent peduncled raceme or a poorly branched panicle in the axils of the leaves and at the end of the branches; bracts subulate, small, very deciduous; calyx nearly 2½ lin. long, glandular-pubescent and sprinkled with copious red resinous dots, the lobes falcate-linear, acuminate; corolla glabrous, slightly longer than the calyx; pods obovoid-oblong, 3-4 lin. long, thinly puberulous and sprinkled with resinous red dots, usually 2-seeded.

Hab.—Common in the savannah and lower mixed forests, also in grassy places in cultivated lands all over Pegu, Prome and Ava; also Martaban.—Fl. C.S.; Fr. H.S.—l.—SS. = ∞. *All.*

6. **F. sericans,** Kz.—A low branched undershrub up to 2½ ft. high, often burnt down to the woody strong trunk, the stems angular, greyish pubescent; leaves digitately 3-foliolate, on a stout, 3-angular, narrowly winged, pubescent petiole only ⅔ to 1 in. long; leaflets more or less obliquely ovate-lanceolate (the terminal one more rhomboid and equilateral), shortly petioluled, bluntish with a mucro to acute, 2-3 in. long, shortly and softly puberulous on both sides, beneath sprinkled with black resinous dots; flowers small, purplish, on a line long pedicels or almost sessile, forming shorter or longer silvery silk-hairy racemes either arising singly or several from the axils of the leaves, or (in burnt-down plants) crowdedly from the trunk (in this case the racemes longer and the flowers somewhat larger); bracts small, ovate, silk-hairy, very deciduous; calyx silvery silk-hairy, 2½ to nearly 3 lin. long, the lobes linear-subulate, the lowermost longest; corolla glabrous, slightly longer; capsules oblong-ovoid, puberulous, not or only sparingly crimson-resinous-dotted, usually 2-seeded.

Hab.—Frequent in the Eng forests of the Prome district and Martaban.—Fl. Fr. H.S.—l.—SS.=Lat.

7. **F. ferruginea,** Grah.—An erect undershrub branched from the base, ½-1½ ft. high, the stems angular, densely tawny pubescent; stipules deciduous; leaves digitately 3-foliolate, on a sulcate pubescent petiole 1-1½ in. long and narrowly winged; leaflets more or less obliquely ovate (the terminal one equilateral and more rhomboid), very shortly petioluled, bluntish to acute, 2-3 in. long, while young almost velvety-puberulous above, beneath strongly nerved and net-veined, sparingly and shortly pubescent; flowers very small, almost sessile, purplish, forming tawny villous, short, spike-like racemes solitary or several together in the axils of the leaves and about as long as the petiole or shorter; bracts small, ovate, ap-

pressed pubescent, very deciduous ; calyx 2 lin. long, tawny villous, the lobes linear, rather thick ; corolla a little longer, glabrous ; pods about 4 lin. long, oblong, puberulous, not or sparingly sprinkled with blackish resinous dots, usually 2-seeded.

HAB.—Frequent in the Eng forests of Prome ; also Ava.—Fl. Fr. March.—l.—SS.=Lat.

8. **F. congesta,** Roxb.; H.f. Ind. Fl. ii. 228.—An erect branched undershrub, all softer parts shortly silk-hairy ; stipules linear-lanceolate, acuminate, very deciduous ; leaves digitately 3-foliolate, on a silky-pubescent, 3-angular, sulcate petiole 1 to 2 in. long and not winged ; leaflets more or less ovate-lanceolate, the lateral ones obliquely so, shortly petioluled, 2-4½ in. long, acuminate, above a little roughish from minute hairs and more or less silky on the nerves, beneath shortly pubescent ; flowers rather small, purplish with a flesh-coloured purplish streaked standard, very shortly pedicelled, racemose, forming short, smoke-grey, silky pubescent, contracted panicles in the axils of the leaves and often shorter than the petiole ; bracts linear-lanceolate, subulate-acuminate, about 4 lin. long, deciduous ; calyx 3½ lin. long, silky pubescent, the lobes linear, subulate-acuminate ; corolla about equally long, glabrous ; pods oblong or ovoid-obong, about 3-3½ lin. long, puberulous, usually 2-seeded.

HAB.—Frequent in the savannahs and savannah forests all over Pegu and Martaban down to Tenasserim.—Fl. close of R.S. ; Fr. C.S. & H.S.—l.—SS.=All. SiS.

9. **F. prostrata,** Roxb.—A small branched undershrub, 1 to 3 ft. high, the stems strongly 3-cornered and shortly appressed tawny pubescent ; stipules linear-lanceolate, subulate-acuminate, deciduous ; leaves digitately 3-foliolate, on a 3-cornered, narrowly winged, appressedly tawny pubescent petiole 1½-2 in. long ; leaflets more or less lanceolate to linear-lanceolate, the lateral ones unequally so, shortly petioluled, long acuminate, 3-4 in. long, above roughish from short hairs, beneath very thinly pubescent and sprinkled with black resinous glands ; flowers small, very shortly pedicelled, forming an appressedly tawny pubescent raceme in the axils of the leaves much shorter than the petiole ; bracts very deciduous ; calyx 2 lin. long, appressed tawny pubescent, the lobes linear-subulate ; corolla slightly longer, glabrous ; pods obliquely oblong, ½ in. long, puberulous and (in the Burmese plant) densely covered with purplish black resinous glands.

HAB.—Not unfrequent in the drier hill, especially the pine, forests of Martaban, at 4,000 to 5,000 ft. elevation.—Fr. March.—l.—Metam.

10. **F. semialata,** Roxb.—An erect, pretty simple or branched undershrub 3-4 ft. high, all parts shortly pubescent ; stipules 3-

angular or lanceolate, subulate-acuminate, deciduous; leaves digitately 3-foliolate, on a 3-angular, narrowly winged, pubescent petiole 1-2 in. long; leaflets more or less ovate-lanceolate, the lateral ones obliquely so, shortly petioluled, acuminate, 2-4 in. long, above slightly roughish from very minute hairs, beneath black-gland-dotted, shortly and thinly appressed hairy and destitute or almost destitute of glandular dots; flowers rather small, rose-coloured with a greenish keel, very shortly pedicelled, racemose, the racemes simple or collected into terminal or axillary silky smoke-grey-pubescent panicles usually longer than the petiole or the leaf; bracts ovate-lanceolate, cuspidate, shorter than the calyx, very deciduous; calyx silky pubescent, about 3 lin. long, the lobes subulate; corolla about equally long, glabrous; pods obliquely ovoid, ½ in. long or somewhat smaller, puberulous, usually 2-seeded.

Hab.—Common in the leaf-shedding forests, and in grassy or shrubby places, more especially in the savannahs, all over Burma.—Fl. C.S.; Fr. H.S.—l.—SS.=∞.

11. **F. latifolia,** Bth.—A stout, erect, branched undershrub 3 to 5 ft. high, the branches (especially while young) appressedly tawny or golden pubescent; stipules very deciduous; leaves digitately 3-foliolate, on a 3-cornered yellowish or tawny puberulous 2-4 in. long petiole narrowly winged and much flattened on the upper side; leaflets more or less obliquely ovate, the terminal one obovate, on a strong tawny- or golden-pubescent petiolule 3 lin. long, shortly acuminate, 4-6 in. long, above almost velvety puberulous, beneath sparingly puberulous, especially on the nerves, and sprinkled with minute crimson resinous glands; flowers rather large and showy, white, with rose-coloured wings, very shortly pedicelled, forming short, solitary or clustered tawny or coppery silk-hairy, rather dense, sessile, spike-like racemes in the axils of the leaves and at the end of the branches; bracts ovate-lanceolate, acuminate, densely tawny silk-hairy, very deciduous, the outer ones up to ½ in. long; calyx about 6 lin. long, densely tawny silky pubescent; lobes subulate, the lowermost twice as long and linear; corolla glabrous, the standard about ½ in. long and nearly as broad.

Hab.—Not unfrequent in the hill-Eng, and the drier hill forests, more especially in the pine-forests, of Martaban, at 2,000 to 4,000 ft. elevation.—Fl. March.—l.—SS.=Metam. Lat.

12. **F. stricta,** Roxb.; H.f. Ind. Fl. ii. 228.—An erect, stout, branched undershrub, the branches angular, shortly appressed tawny pubescent; stipules linear-lanceolate, 1 in. long or longer, very deciduous; leaves digitately 3-foliolate, on a triquetrous slightly pubescent petiole ¼ to ⅔ ft. long and often narrowly winged upwards; leaflets lanceolate to ovate-lanceolate, the lateral ones somewhat unequally so, on a strong, appressedly tawny pubescent

petiolule 2-3 lin. long, acuminate, 4-7 in. long, above more or less rough from minute appressed hairs, beneath (especially on the nerves) thinly and minutely appressedly tawny pubescent; flowers small, greenish and dirty purple-streaked, with purple wings, very shortly pedicelled, forming a solitary or few dense, spike-like, sessile, silky pubescent racemes in the axils of the leaves, while young densely imbricated and strobiliform from the linear-lanceolate or lanceolate acuminate long but deciduous bracts, the basal outer bracts broader, thinly silk-hairy, up to 1½ in. long; calyx about 4 lin. long, densely silvery silk-hairy; lobes linear, acuminate, the lowermost nearly doubly longer; corolla glabrous, nearly ⅓ in. long; pods oblong, ½ in. long, minutely appressedly puberulous, 2-seeded.

Hab.—Not unfrequent in the open forests, especially the low and Eng forests, of Pegu; also Chittagong and Ava.—Fl. C.S.—l.—SS.=Dil.

13. **F. capitata,** Zoll. (*F. involucrata,* Bth.; H.f. Ind. Fl. ii. 229).—An erect meagre shrub, 3 to 5 ft. high, the branches terete or nearly so, more or less pubescent; stipules linear-oblong, acute, deciduous; leaves digitately 3-foliolate, on a pubescent ½-¾ in. long petiole; leaflets more or less lanceolate to linear, the lateral ones unequally so, acuminate or acute, 1½-2½ in. long, shortly and softly puberulous on both sides, more so on the pale-coloured under-surface; flowers small, collected in dense pilose peduncled or almost sessile heads in the axils of the leaves and terminal; all bracts persistent, silky pilose, the outer ones up to ⅔ in. long, ovate, long silky-ciliate; calyx silky pilose, about 6 lin. long, the lobes subulate; corolla as long, minutely appressed sericeous; pods enclosed in the calyx, silky pilose, obovoid, about 2 lin. long, usually 1-seeded, the seed compressed, elliptical.

Hab.—Frequent in the open, especially in the low forests, ascending into the drier hill forests, all over Pegu and Martaban down to Upper Tenasserim.—Fl. Fr. C.S.—l—.SS.=Dil.—Metam. *Arg.*

CAJANUS, DC.

Calyx-lobes acuminate or acute, the 2 upper ones more or less connate. Standard orbicular, reflexed, furnished with inflexed auricles; wings obliquely obovate; keel incurved at the blunt apex. Stamens united in a sheath, the vexillar one free; anthers uniform. Ovary almost sessile, with many ovules; style beardless, thickened above the middle and slightly dilated below the obliquely terminal stigma. Pod oblong to linear, transversely torose, septate within between the seeds, several-seeded.—Erect shrubs or undershrubs, with pinnately 3-foliolate leaves. Stipules deciduous; stipulets none. Flowers in axillary racemes. Bracts very caducous, bractlets none.

1. **C. Indicus,** Spreng.; H.f. Ind. Fl. 217.—*Pai-si-gong* or *Pai-yin-chong.*—An erect, branched, shrubby perennial, 5-8 ft. high, all parts more or less velvety pubescent; leaves pinnately 3-foliolate, on a pubescent petiole ¼ to ½ in. long; leaflets more or less lanceolate to oblong-lanceolate, shortly petioluled, acute, 1-2 in. long, velvety above, beneath more or less silvery silk-hairy; flowers middling-sized, yellow (or the outside brown-purple), on densely puberulous slender pedicels about 3-4 lin. long, arising by pairs and forming a long-peduncled but short, densely puberulous raceme in the axils of the leaves; calyx nearly 4 lin. long, tawny puberulous, the teeth lanceolate, subulate; corolla nearly ½ an in. long; pods oblong- to linear-lanceolate, subulate-acuminate, compressed and strongly transversely torose, 1-1½ in. long, shortly pubescent, usually 4-seeded; seeds about 2½ lin. long, ovoid, glossy black.

Hab.—Generally cultivated in several varieties all over Burma, up to 3,000 ft. elevation.—Fl. Fr. C.S.—l.—SS. = ∞.

CYLISTA, Ait.

Calyx-lobes bladdery, blunt, much enlarging after flowering, the 2 upper ones united in a single 2-lobed one, the 2 lateral ones much smaller, the lowermost largest and boat-shaped. Standard almost orbicular, inflexed-auricled at base, the wings narrow; keel incurved, blunt. Stamens united in a sheath, the vexillar one free; anthers uniform. Ovary almost sessile, 1-ovuled; style filiform with a terminal stigma. Pod enclosed in the enlarged scarious calyx, 2-valved, 1-seeded.—Twining, shrubs with pinnately 3-foliolate leaves, the leaflets resinose-dotted beneath. Flowers in axillary and terminal racemes. Bracts membranous, deciduous; bractlets none.

1. **C. scariosa,** Ait.; H.f. Ind. Fl. ii. 219.—An extensive twining shrub, or rather undershrub, all parts more or less pubescent or puberulous; leaves pinnately 3-foliolate, on a pubescent 1-1½ in. long petiole; leaflets more or less ovate, the lateral ones obliquely so, acuminate, 1-2 in. long, on both sides (more so beneath) shortly pubescent; flowers middling-sized, yellow with orange longitudinal veins, on 2-3 lin. long pubescent pedicels, forming shorter or longer puberulous racemes in the axils of the leaves and often also at the end of the branchlets; calyx in flower about ½ in. long, in fruit doubly longer, puberulous; corolla much shorter and enclosed in the calyx; pods quite enclosed in the scarious large calyx, about 4 lin. long, falcate-obovate, almost stalked, pubescent, 1-seeded.

Hab.—Frequent in the leaf-shedding forests, especially the mixed ones, but also in deserted toungyas, etc., all over Pegu and Martaban.—Fl. close of R.S.; Fr. H.S.—l.—SS.= ∞.

MUCUNA, Ad.

Calyx broadly bell-shaped, 4-toothed, the upper tooth broader and bidentate, the lowermost longer. Standard shorter than the wings, the keel as long or longer than the wings, with a horny point or beak at the incurved end. Stamens united in a sheath, the vexillar one free; anthers often bearded, alternately longer and erect, the shorter didymous and versatile. Ovary sessile with usually few ovules; style filiform, not bearded, with a minute terminal stigma. Pod linear to oblong and almost ovoid, variously transversely laminate, ribbed or plain, 2-valved, septate between the large seeds.—Scandent or twining shrubs or undershrubs with pinnately 3-foliolate leaves. Stipules deciduous; stipulets often present. Flowers usually showy, in pendulous peduncled axillary racemes or corymbs. Bracts small or large, deciduous.

* *Pods transversely and obliquely lamellate, 1-seeded* . . *M. monosperma.*
* * *Pods plain or longitudinally ribbed.*
○ Pods shortly stalked or acuminate at the base. Seeds orbicular.
Pod 3-4 in. long, appressed tawny hispid, the sutures extended in a plaited double wing; flowers white or yellowish . . . *M. gigantea.*
Pod 1-3 ft. long, glabrescent, towards the sutures marked with a fold-like longitudinal rib; flowers variegate-dark-purple . *M. macrocarpa.*
○ ○ Pods sessile, densely hispid. Seeds transversely oblong.
Peduncle naked; flowers arising from a knob; pods with 2 longitudinal ribs along the upper suture; leaves pubescent beneath . *M. pruriens.*
Peduncle bracted; flowers from a secondary peduncle about 2 lin. long; pod without ribs; leaves appearing glabrous to the naked eye . . . . . *M. bracteata.*

1. **M. monosperma**, DC.; H.f. Ind. Fl. ii. 185.—A large twining shrub, the shoots rusty-pubescent; leaves pinnately 3-foliolate, on a rusty-pubescent 3-4 in. long petiole; leaflets more or less ovate, the lateral ones very obliquely so, on a rusty-pubescent petiolule 2-3 lin. long, apiculate to acute, 2-4 in. long, chartaceous, glabrous above, beneath tawny or rusty-pubescent and more or less glabrescent; flowers large, dark-purple, with a white keel, on about $\frac{2}{3}$-$\frac{3}{4}$ in. long pubescent pedicels, forming a very short-peduncled nodding pubescent corymb in the axils of the leaves or above the scars of the fallen ones; bracts about a line long, ovate, acuminate; calyx about $\frac{1}{3}$ in. wide, minutely hispid and, besides, more or less covered with tawny or rusty-brown fragile bristles; corolla about $1\frac{1}{2}$ in. long, the standard about half as long as the keel; pods thick, obliquely ovate, contracted in a short very thick stalk, tawny velvety-tomentose and covered with long fragile stinging bristles, all round extended in a double spreading waved wing and similarly transversely and obliquely lamellate all over the valves, the lamellæ either continuous or irregularly broken half-way

and all simple and waved; seed solitary, ovoid-reniform, about an in. long, brownish black, encircled on the back with a grey opaque hilum.

HAB.—Frequent in the mixed forests, especially the lower ones, all over Pegu, Chittagong, and Arracan.—Fl. close of R.S.; Fr. D.S.—l.—SS.=SiS. All.

2. **M. macrocarpa,** Wall.; H.f. Ind. Fl. ii. 186.—A powerful arboreous climber, the stems as thick as the arm or thicker (up to 2 ft. girth), the shoots thinly tawny pubescent; stipules very deciduous; leaves pinnately 3-foliolate, on a 3-5 in. long glabrescent petiole; leaflets more or less ovate, the lateral ones very obliquely so, on a 3-4 lin. long petiolule, shortly subulate-cuspidate, 4-6 in. long, chartaceous, while young herbaceous and on both sides appressed tawny pubescent, adult glabrous above; flowers large, greenish with dark-purple wings and brownish keel, on ½ an in. long tawny pubescent pedicels, usually by 2 or 3 from a knob or reduced secondary peduncle and forming an elongate pendulous tawny-pubescent raceme in the axils of the leaves; bracts very deciduous; calyx tawny-velvety, about ¾ in. wide; corolla 1½ to nearly 2 in. long, the standard about half as long as the keel; pods 1-3 ft. long by 1½ in. broad, linear and sinuate-contracted between the seeds, marked with a fold-like longitudinal rib towards the margins of both sutures, while young tawny tomentose, glabrescent, many-seeded, the lower joints gradually narrower and empty; seeds flat, transversely elliptically-orbicular, nearly an inch long, brown, encircled with a pale-coloured hilum.

HAB.—Not unfrequent in the hill forests, especially the drier and pine forests of Martaban, east of Tounghoo, at 4,000 to 6,000 ft. elevation; also Ava.—Fl. March; Fr. H.S.—l.—SS.=Metam.

DIOCLEA, HBK.

The 2 upper calyx-lobes entirely connate, the lateral ones smaller. Standard orbicular or ovate, reflexed, minutely auricled at the base; wings obovate or oblong, free, longer than the incurved beaked or blunt keel. Stamens united in a sheath, the vexillar one entirely or only at the base free; anthers difform, the alternating ones minute and gland-like. Ovary sessile, with 2 or more ovules; style incurved, beardless, thickened or dilated towards the apex, with a terminal truncate stigma. Pod flat, compressed or somewhat turgid, coriaceous, 2-valved, septate, the upper suture dilated or 2-winged.—Twining shrubs, with pinnately 3-foliolate leaves. Stipules herbaceous; stipulets present. Flowers clustered, in axillary racemes. Bracts narrow, especially the upper ones partially persistent; bractlets small, persistent or deciduous.

1. **D. reflexa,** H.f.; Ind. Fl. ii. 196.—A large scandent shrub,

the younger branchlets thinly tawny hirsute; stipules ½ an in. long linear-lanceolate, acuminate; leaves pinnately 3-foliolate, on a hirsute petiole; leaflets on a short tawny hirsute petiolule, obovate to obovate-oblong, the lateral ones somewhat unequal, apiculate or shortly and abruptly acuminate, 3-4 in. long, thin coriaceous, on both sides (more so beneath) thinly tawny hairy, more or less glabrescent above; flowers middling-sized, pale-lilac, shortly and strongly pedicelled, clustered, forming a robust, long-peduncled, tawny tomentose raceme in the axils of the leaves; bracts linear, subulate-acuminate, ½-1 in. long, appressed tawny pubescent, the upper ones persistent; calyx tawny silk-hairy, nearly ½ an in. long, the 2 upper lobes connate and rounded; corolla about ¾ in. across; pods dimidiate-oblong, 2½ in. long by 1½ broad or larger, dilated at the upper suture, while young appressed and densely tawny pubescent, more or less glabrescent, 2- or rarely 1-seeded.

HAB.—Andamans.

LESPEDEZA, Mich.

Calyx-lobes or -teeth almost equal or the 2 upper ones shortly united. Standard orbicular, obovate or oblong, clawed or rarely sessile; keel blunt or beaked, free. Stamens all united in a sheath or more usually the vexillar one free; anthers all reniform. Ovary sessile or stalked, with a solitary or rarely 2 ovules; style filiform, with a small terminal stigma. Pod ovate to orbicular, flat, net-veined, indehiscent.—Shrubs or undershrubs, rarely herbs, with pinnately 3- or rarely 1-foliolate leaves. Stipules usually small or very deciduous; stipulets none. Flowers in axillary clusters or racemes often collected in terminal panicles.

× Flowers in axillary almost sessile clusters . . . *L. sericea.*
× × Flowers in axillary and terminal racemes often collected in a terminal panicle.
+ All parts densely pubescent; bracts deciduous . . *L. pinetorum.*
+ + Branchlets and leaves beneath appressed canescent-puberulous.
Racemes glandular-pubescent; bracts persistent . . . . *L. decora.*
Racemes tawny pubescent, not glandular; bracts deciduous . . *L. parviflora.*

1. **L. sericea,** Miq.; H.f. Ind. Fl. ii. 142.—A small erect shrub much branched from the base, 1-3 ft. high, all softer parts more or less appressed silvery pubescent; stipules stiff, linear-subulate, about 1½ lin. long; leaves small, pinnately 3-foliolate, on a silky pubescent petiole 2-3 lin. long; leaflets oblong to linear-cuneate, almost sessile, ⅓-⅔ in. long, truncate at the apex and bristly mucronate, beneath more or less thinly appressed silk-hairy; flowers small, pale yellow or white with the standard purple at the middle, very shortly pedicelled, forming a short, poor, almost sessile

appressed silk-hairy cluster in the axils of the leaves, those of the lower clusters often apetalous with imperfect stamens; calyx 2 to nearly 3 lin. long, slightly pubescent, the lobes stiff, linear-subulate, acuminate; corolla 4 lin. long; pods almost rotundate, compressed, appressed silk-hairy, 1½ to 2 lin. long, 1- rarely 2-seeded.

HAB.—Ava hills east of Bhamo.—Fl. May.

2. **L. pinetorum,** Kz.—An erect branched or almost simple-stemmed shrub, 2-4 ft. high, all parts softly tawny pubescent, the stems angular; stipules 2-3 lin. long, ovate-lanceolate, acuminate, pubescent; leaves pinnately 3-foliolate, on a strong tawny pubescent petiole ½-1 in. long; leaflets on a very thick and short petiolule, elliptically to oval-oblong, blunt or bluntish with a mucro, 1-2 in. long, almost coriaceous, puberulous and almost wrinkled above, beneath densely pubescent, the nervation prominent; flowers rather small, yellowish with the keel pale-rose at the tip, on pubescent 1-2 lin. long pedicels, forming dense rather robust tawny pubescent racemes in the axils of the leaves and usually collected also in a short panicle at the end of the branches, flexuose; calyx 2½-3 lin. long, tawny villous, the lobes subulate; corolla about 3½ to 4 lin. long; pods obliquely ovate, compressed, stylose-acuminate, about 3 lin. long, appressed silky pubescent.

HAB.—Not unfrequent in the drier hill forests, especially the pine forests, of the Martaban hills, east of Tounghoo, at 4,000 to 6,000 ft. elevation.—Fl. Fr. March.—l.—SS.=Metam.

3. **L. decora,** Kz.; H.f. Ind. Fl. ii. 144.—An erect branched shrub, 3 to 5 ft. high, the stems angular and minutely greyish, when young appressed tawny pubescent; stipules about 3 lin. long, stiff, linear-subulate; leaves pinnately 3-foliolate, on a slender 1-1½ in. long petiole; leaflets shortly petioluled, oboval to almost elliptical, rounded with a mucro, chartaceous, 1-1½ in. long, dark-green and glabrous above, beneath glaucescent and minutely appressed pubescent; flowers bright-blue, middling-sized, on slender about ½ an in. long glandular-pubescent pedicels, forming short but slender tawny glandular-pubescent persistent-bracted racemes often collected into short panicles in the axils of the leaves and at the end of the branches; bracts ovate-lanceolate, subulate-acuminate, about a line long, glandular-puberulous; calyx about 3 lin. long, tawny pubescent, the lobes ovate, acuminate; corolla ½ an in. long; pods (unripe) obliquely ovate-lanceolate, acuminate, compressed, shortly appressed silk-hairy.

HAB.—Frequent in the drier hill forests, especially the pine forests, at 4,000 to 6,000 ft. elevation.—Fl. March; Fr. Apr.—l.—SS=Metam.

4. **L. parviflora,** Kz.; H.f. Ind. Fl. ii. 144.—A shrub, the branchlets angular, appressed silky-puberulous; stipules stiff, linear-

subulate, about 2-2½ lin. long; leaves pinnately 3-foliolate, on a slender canescent petiole ½ an in. long; leaflets shortly petioluled, elliptical to elliptically ovate, ½-1 in. long, chartaceous, glabrous and dark-green above, beneath glaucescent and minutely appressed greyish pubescent; flowers small, blue (?), on tawny pubescent ½-1 lin. long pedicels, forming stiff tawny pubescent racemes in the axils of the leaves and often crowded at the end of the branchlets; bracts deciduous; calyx densely tawny pubescent, about 2 lin. long, the lobes subulate; corolla about 3½ lin. long; pods (unripe) obliquely ovate, acuminate, silk-hairy.

HAB.—Martaban, Karen hills.

DESMODIUM, Desv.

Calyx-tube short, the 2 upper lobes or teeth more or less united, the lower 3 acute or subulate-acuminate. Standard from oblong to orbicular, at the base tapering or clawed; wings adhering to the keel, the latter blunt or rarely somewhat beaked, rather straight or incurved. Stamens all united in a closed tube or the vexillar one more or less free; anthers conform. Ovary sessile or stalked, with 2 or more ovules; style inflexed or incurved, with a terminal minute capitate stigma. Pods longer than the calyx, sessile or stalked, compressed, the articles more or less dehiscent along the lower suture or indehiscent, many- rarely 1-seeded.—Shrubs or undershrubs, rarely herbs, with pinnately 3-foliolate or 1-foliolate leaves. Stipules and stipulets present. Flowers usually small, in terminal racemes or panicles, or rarely in axillary umbels or clusters.

* *Flowers clustered in the axils of bract-like large complicately 2-foliolate persistent floral leaves.*

× Pods glabrous, except on the margin, net-veined; petiole only 2-3 lin. long . . . . . *D. pulchellum.*

× × Pods pubescent or villous-pubescent.

Leaflets 1-2 in. long, rounded or almost retuse . . . . *D. vestitum.*

Leaflets 3-5 in. long, acuminate . . . . . *D. grande.*

* * *Inflorescence without floral leaves. Bracts deciduous, rarely persistent.*

○ Leaves 1-foliolate.

Branches 3-4-cornered; petiole leafy-winged . . . . *D. triquetrum.*

Branches and petioles terete . . . . . *D. latifolium.*

○ ○ Leaves 3-foliolate.

+ Pods indehiscent.

† Flowers in small axillary umbels.

Pod-joints ⅓ in. long . . . . . *D. umbellatum.*

Pod-joints only 2 lin. long . . . . . *D. cephalotes.*

†† Flowers in terminal or axillary racemes or panicles.

△ Pod-joints usually as long or about doubly longer than broad, more or less indented on the one or both sutures.

§ Bracts of young inflorescence narrow and inconspicuous and not imbricating . . *D. laburnifolium.*

§§ Bracts of young inflorescence scarious and large, forming imbricate cones, the basal ones often persistent.

‡ Basal pod-joint shortly but distinctly stalked.

Racemes sessile or nearly so, robust; pod-joints 4 lin. long by 2½ broad, grey-villous, much indented on the lower suture; branchlets rather terete . . . . . *D. confertum.*

Racemes very slender and usually shorter than the leaves, sessile or branched from the base; pod-joints as in preceding, sparingly and shortly hirsute; branches angular . . . . . *D. Karensium.*

‡‡ Basal pod-joint sessile.

Pod-joints 1½-2 lin. long and nearly as broad, appressed hirsute; branchlets sharply angular, often villous on the angles . *D. floribundum.*

Pod-joints about a line long and as broad, densely brown-hooked-hispid; branchlets almost terete . . . . . *D. sequax.*

△△ Pod-joints 4-5 times longer than broad, or stalk-like narrowed at the base.

Pod-joints crescent-shaped, abruptly constricted at both ends; leaves oblong, strongly parallel-nerved . . . . . *D. concinnum.*

++ Pods dehiscent.

† Bracts of young inflorescence more or less persistent. Pods distinctly jointed.

Leaves 1-3-foliolate; fruiting pedicels refracted; racemes shorter than the leaves . . . . . *D. retroflexum.*

Fruiting pedicels erect; racemes elongate . . . . . *D. heterocarpum.*

†† All bracts deciduous; valves of pod continuous, the joints marked only by transverse lines.

Flowers purple; pod-joints broader than long, densely and shortly hirsute . . . . . *D. gyroides.*

1. **D. pulchellum,** Bth.; H.f. Ind. Fl. ii. 162; Brand. For. Fl. 145.—*Toung-ta-min.*—An erect branched shrub, 3-4 ft. high, the softer parts shortly pubescent; stipules and stipulets small, stiff, lanceolate, subulate-acuminate; leaves pinnately 3- or occasionally 1-foliolate, on an appressed pubescent petiole 2-3 lin. long; leaflets more or less lanceolate (the lateral ones much smaller and oblique), on a very short petiolule, 1-3 in. long, bluntish to bluntish acuminate with a mucro, slightly remote-repand, chartaceous, above glabrous or nearly so, beneath, especially along the nerves and veins, minutely pubescent; flowers small, yellow, in a small sessile head or cluster, in the axil of a 2-foliolate floral leaf and more or less enclosed in it, forming elegant leafy racemes at the end of the branchlets collected in a panicle; floral leaves complicately 2-foliolate, on a 2 to 3 lin. long petiole terminating in a longer or shorter bristle, the leaflets more or less broadly ovate to almost orbicular, ½-⅔ in. long, very shortly petioluled, more or less oblique, rounded or retuse with a mucro, almost glabrous or puberulous; bracts linear-lanceolate to subulate, small; calyx about a line long, pubescent, the teeth lanceolate, acuminate; corolla about 3 lin. long, glabrous; pods flat, usually 2-jointed, the joints more or less rounded at both sides,

about 2½ lin. long and nearly as broad, laxly net-veined and glabrous, except on the margins, each containing a single glossy pale-coloured seed.

HAB.—Frequent in the leaf-shedding, especially the open and dry, forests all over Burma from Ava and Martaban down to Tenasserim.—Fl. R.S.; Fr. C.S.—l.—SS.=∞.

2. **D. grande,** Kz.; H.f. Ind. Fl. ii. 162.—An erect branched shrub, the branchlets softly and shortly tawny tomentose; stipules and stipulets stiff and short, linear, subulate-acuminate; leaves pinnately 3- or occasionally 1-foliolate, on a tawny tomentose petiole ½ to 1 in. long; leaflets 3-5 in. long, shortly petioluled, more or less ovate, rather long but bluntish acuminate with a mucro, entire, chartaceous, puberulous above, softly and almost tawny pubescent beneath; flowers forming leafy, axillary and terminal racemes collected in a terminal panicle, the rachis tawny tomentose; floral leaves 2-foliolate, on a 2-3 lin. long tomentose petiole terminating in a long bristle, the leaflets obliquely oval to almost orbicular, rounded or retuse with a mucro, more or less puberulous, about an in. long; pods 2-3-jointed, tomentose-pubescent, twice as large as those of the preceding species.

HAB.—Ava, Irrawaddi valley.—Fr. C.S.

3. **D. vestitum,** Bth.; H.f. Ind. Fl. ii. 162.—An erect branched shrub, the younger branches softly tawny pubescent; stipules broadly lanceolate, acuminate, about 1½ lin. long; leaves pinnately 3-foliolate, on a rusty or tawny tomentose 3-4 lin. long petiole; leaflets oval or elliptical, shortly petioluled, rounded or retuse, 1-2 in. long, minutely pubescent above, appressed silky pubescent beneath; flowers in leafy tawny tomentose racemes collected in a terminal panicle; floral leaves 2-foliolate, on a tomentose about a line long petiole terminating in a short bristle, cordate-orbicular, retuse with a mucro, puberulous, ⅔-1 in. long; calyx pubescent, the lobes lanceolate, acuminate; pods 2-3-jointed, twice as large as those of *D. pulchellum,* densely tawny pubescent.

HAB.—Upper Tenasserim.

4. **D. triquetrum,** DC.; H.f. Ind. Fl. ii. 163.—*Mot-so-lam-ma.*—An erect or spreading branched undershrub or shrub 2 to 4 ft. high, the branches sharply 3- (or 4-) cornered and more or less villous or pubescent on the angles; stipules scarious, linear-lanceolate, up to ½ in. long, deciduous; leaves 1-foliolate, the petiole ½-1 in. long, leafy-winged and produced in a sharp tooth at both sides of the rounded apex; leaflets 2-5 in. long, linear-oblong to oblong-lanceolate, very shortly petioluled, acuminate to bluntish chartaceous, glabrous or slightly hispid beneath along the nerves; flowers small,

pink or pale rose-coloured, on filiform 2-3 lin. long hairy pedicels, clustered, and forming slender, terminal and axillary, slightly hairy racemes; bracts linear, acuminate, small, but stiff, strongly parallel-veined; calyx sparingly hispid, 2 lin. long, the teeth rather short, subulate; corolla nearly 4 lin. long, glabrous; pods oblong to linear-oblong, straight or slightly curved, flat, villous to glabrous, many-jointed, the joints about 2 lin. long and nearly twice as broad, rounded at one side, or almost straight, each containing a single glossy pale or dark-coloured seed.

Hab.—Common all over Burma from Chittagong and Ava down to Tenasserim and the Andamans, in all leaf-shedding forests, especially the mixed ones, but ascending also into the drier hill forests up to 5,000 ft. elevation.—Fl. Fr. close of R.S. and C.S.—l.—SS.=∞.

5. **D. latifolium,** DC.; Brand. For. Fl. 145; H.f. Ind. Fl. ii. 168.—*Kio-pan-ben.*—A large bushy shrub, 3 to 5 ft. high and higher, with more or less spreading branches, all the softer parts softly pubescent or tomentose; stipules linear-subulate, rather stiff; leaves 1-foliolate, on a tawny villous petiole 2 to 4 lin. long; leaflets more or less ovate to ovate-oblong, very shortly petioluled, rounded at the base, bluntish or acute with a mucro, 1½-3 in. long, firmly membranous, slightly repand, above appressed and rather stiff-hairy, beneath softly pubescent or almost villous; flowers small, purple, on very short pubescent pedicels, clustered and forming a tawny pubescent or almost villous raceme in the axils of the leaves and terminal, and often also collected in lax terminal panicles; bracts and bractlets small, linear-subulate; calyx a line long, pubescent, the teeth linear-lanceolate; corolla about 3 lin. long or somewhat longer, glabrous; pods linear-oblong, often somewhat curved, sessile, compressed, villous, 6-3-jointed, the joints almost quadrangular with the outer suture rounded, about 2 lin. long, each containing a single brown seed.

Hab.—Frequent in the dry and open forests of Ava, Prome, Pegu, and Martaban.—Fl. close of R.S.; Fr. C.S.—l.—SS.=Dil. CaS.

6. **D. umbellatum,** DC.; H.f. Ind. Fl. ii. 161; Bedd. Sylv. Madr. 87.—A large shrub, 6 to 10 ft. high, the shoots silky pubescent; stipules about a line long, lanceolate, ciliate, stipulate; leaves pinnately 3-foliolate, ⅓-½ ft. long, on a pubescent petiole ½ to 1 in. long; leaflets more or less elliptical to elliptically ovate, the terminal one often more obovate and larger, 1½-2½ in. long, on densely appressed pubescent petiolules a line long or a little longer, acute or bluntish with a mucro, chartaceous, glabrous above, beneath glaucescent and thinly appressed silk-hairy; flowers small, white, on 2 lin. long pedicels, forming a short-peduncled densely silky villous umbel in the axils of the leaves and usually shorter than the petiole; bracts and bractlets longer than the pedicels, lanceolate, silky

villous; calyx yellowish silky villous, more than 2 lin. long, the teeth linear-lanceolate, acuminate; corolla glabrous, ⅓ in. long; pods on a 3 lin. long densely pubescent peduncle, usually destitute of the calyx, oblong to elongate-oblong, more or less curved, densely appressed pubescent, 4-1-jointed, the articles reniform-oblong, ⅓ in. long, compressed with rounded borders, each joint containing a compressed, reniform-oblong, glossy black seed.

Hab.—Not unfrequent in the sandy beach jungles along the coasts of the Andamans and probably all along the Burmese coasts, reappearing again in Ava, on the limestone hills of Segain.—SS. = Aren. Ca. (?)

7. **D. cephalotes,** Wall; H.f. Ind. Fl. ii. 162; Bedd. Sylv. Madr. 87 t. 12, f. 4.—A large shrub, often growing out into a small tree with a short trunk about 2-3 ft. in girth, all softer parts appressed silk-hairy; stipules scarious, linear-lanceolate, subulate, acuminate, ¼ to ⅓ in. long; stipulets setaceous-filiform, long; leaves pinnately 3-foliolate, on a channelled petiole ½ to an in. long; leaflets obovate to elliptically lanceolate, on a line long pubescent or almost glabrous petiolule, shortly acuminate to acute, 1½ to 2½ lin. long, chartaceous, glabrous above, beneath, especially along the straight parallel nerves, appressed silvery silk-hairy, or rarely almost glabrous; flowers small, white, on short, slender, curved, silk-hairy pedicels, forming an almost sessile or short-peduncled, more or less silky pubescent umbel in the axils of the leaves and shorter than the petioles; bracts and bractlets linear, subulate-acuminate, longer than the pedicels; calyx silky pubescent, nearly 3 lin. long, the lobes linear-subulate, the lowermost much elongated; corolla glabrous, about ⅓ in. long; pods linear-oblong, flat, more or less curved, more or less silky pubescent, rarely almost glabrous, ½ to ⅔ in. long, 2-5- rarely by abortion 1-jointed, the articles about 2 lin. long and broad or somewhat longer, rounded on one side, each containing a single brown compressed elliptically reniform seed.

Hab.—Common all over Ava and Chittagong down to Pegu and Arracan, in the mixed forests, especially the lower ones, also entering the savannahs.—Fl. close of R.S.; Fr. C.S.—l.—SS. = ∞. SiS. All.

8. **D. sequax,** Wall.; H.f. Ind. Fl. ii. 170.—An erect-branched shrub, 3-4 ft. high, the branchlets brown-puberulous; stipules curved-linear, acute, pubescent, 2 lin. long or longer; leaves pinnately 3-foliolate, on a densely brown-pubescent petiole 1-⅔ in. long; leaflets more or less ovate (the lateral ones obliquely so and somewhat smaller), on a line long rusty-pubescent petiolule, shortly acuminate, slightly repand, 1½-3 in. long, membranous, shortly and thinly appressed hairy above, more densely so on the pale-coloured under-surface; flowers small, purple (?), on slender about 3 lin. long pubescent pedicels, forming short, usually paired, tawny-pubescent racemes in the axils of the leaves and often passing into a

terminal leafy panicle; bracts about 1-1½ lin. long, linear-lanceolate, acuminate, pubescent, very deciduous; calyx more than a line long, sparingly hirsute, the teeth lanceolate-acuminate; corolla about 4 lin. long; pods almost moniliform, elongate-linear, sessile, compressed, shortly and densely brown or greyish brown hirsute, 7-12-jointed, the articles nearly 1½ lin. long and broad, indehiscent, on the outer suture slightly, on the inner strongly, rounded, each containing a blackish almost orbicular seed.

HAB.—Martaban hills, east of Tounghoo, in the drier forests, at 4,000 to 5,000 ft. elevation.—Fr. March.—l.—SS. = Metam.

9. **D. Karensium,** Kz.—A large simple or almost simple-stemmed shrub, all softer parts more or less pubescent, the stems angular, glabrescent; leaves 3-foliolate, large, on a glabrescent petiole 2-3 in. long; leaflets rhomboid-ovate, the lateral ones obliquely so, on a very short, stout, tomentose petiolule, shortly acuminate, 3-5 in. long, membranous, above minutely puberulous, beneath almost greyish pubescent; racemes filiform, branched from the base or more usually forming a sessile or almost sessile puberulous glabrescent panicle in the axils of the leaves and often shorter than them; pedicels filiform, by 3-1, puberulous, 3-4 lin. long; bracts deciduous, linear-lanceolate, acuminate, hirsute-ciliate, deciduous, the basal ones more persistent, larger and 3-3½ lin. long; calyx (in fruit) sparingly hirsute, about 2 lin. long or somewhat longer, the lobes linear-subulate; pods linear, 1-1½ in. long, many-jointed, shortly hirsute, the joints a little longer than broad, 3 lin. long, truncate at both ends, the outer suture slightly, the inner strongly, rounded.

HAB.—Not unfrequent in the drier hill forests, especially the pine forests, of the Martaban hills, at 4,000 to 5,000 ft. elevation; also Ava, Khakyen hills.—Fr. March-Apr.—l.—SS. = Metam.

10. **D. floribundum,** Don.; H.f. Ind. Fl. ii. 167.—An erect-branched shrub, 2-4 ft. high, the stems and branches, especially while young, 5-angular and densely villous fringed along the angles; stipules appressed pubescent, linear-lanceolate, subulate-acuminate, ⅓-½ in. long; leaves pinnately 3-foliolate, on a tawny pubescent strong petiole ½-1 in. long; leaflets more or less obovate (the lateral ones oblique and often more ovate), blunt or acute to shortly acuminate, mucronate, 1-3 in. long, entire or nearly so, firmly membranous, above thinly, beneath more densely, appressed pubescent and glaucescent; flowers rather small, purple (?), on capillary 2-3 lin. long puberulous pedicels, forming longer or shorter tawny pubescent racemes usually by 2 or 3 or solitary in the axils of the leaves or in the forks of, or terminating, the branchlets; bracts very deciduous, linear-lanceolate, subulate-acuminate, 3-4 lin. long; calyx very slightly pilose, nearly 2 lin. long, the lobes lanceolate-

acuminate, the lateral ones shorter; corolla about 4 lin. long; pods sessile, elongate-linear, compressed, appressed tawny or brown-hirsute, sinuately 7- to 4- or fewer-jointed, the articles 1½ to 2 lin. long and somewhat narrower, slightly curved on the outer, rounded on the inner margin, each containing a single reniform-oblong brown seed.

HAB.—Not unfrequent in the hill forests of Martaban and Upper Tenasserim, at 4,000 to 5,000 ft. elevation.—Fl. close of R.S.; Fr. March.—l.—SS. = Metam.

11. **D. concinnum,** DC.; H.f. Ind. Fl. ii. 170.—An erect, branched shrub, 2-4 ft. high, the younger branchlets shortly tawny pubescent; stipules scarious, ½ an in. long or somewhat shorter, linear-lanceolate, subulate-acuminate, striate, glabrous; stipulets subulate, 3-2 in. long; leaves pinnately 3-foliolate, on an appressed pubescent petiole ¼-½ in. long; leaflets obovate-oblong to elliptically-oblong, on a short tawny pubescent petiolule, mucronate-acute, 1-2½ in. long, entire, chartaceous, above very slightly, beneath thinly, appressed pubescent, the oblique lateral nerves almost straight and parallel; flowers rather small, purple (?), on spreading straight pilose pedicels about ⅓ in. long, usually paired and forming tawny glandular-pubescent slender terminal racemes; bracts large but very deciduous, lanceolate, acuminate ½-⅓ in. long, sparingly pilose but densely pilose-fringed; calyx shallow, about 2½ lin. across, minutely and sparingly puberulous, 2 of the teeth more produced and acuminate; corolla glabrous, nearly ⅓ in. long; pods on a spreading 2 lin. long stalk, minutely glandular-puberulous, 5-1-jointed, the articles somewhat compressed, crescent-shaped, about 2 to 2½ lin. long, indehiscent, each containing a single glossy-brown reniform seed.

HAB.—Not unfrequent in the hill pastures and in grassy places of the drier hills, especially the pine forests, of Martaban, at 4,000 to 6,000 ft. elevation.—Fr. March.—l.—SS. = Metam.

12. **D. gyroides,** DC.; H.f. Ind. Fl. ii. 175.—A spreading erect shrub, from a few feet up to 5 ft. high, the stems almost terete and glabrous, under favourable circumstances up to 1½ in. thick, the branchlets thinly or thickly pubescent; bark thin, blackish; stipules from a broad base lanceolate, subulate-acuminate, striate, scarious; stipulets subulate, 1-1½ lin. long; leaves pinnately 3- and often also 1-foliolate, on a more or less pubescent ⅓ to ½ in. long petiole; leaflets elliptical to obversely oval and oblong, very shortly petioluled, 1-2 in. long (the lateral ones usually small or at least smaller than the terminal one), rounded, blunt or almost retuse with or without a minute mucro, thin chartaceous, glabrescent above, more or less thinly appressed pubescent beneath; flowers middling-sized, purple, on 3 to 4 lin. long usually yellowish pilose pedicels, forming a rather short but rather crowded peduncled or almost

sessile raceme in the axils of the leaves and at the end of the terminal and axillary branchlets, the rachis tawny or yellowish villous, rather strong and often much scared; bracts very deciduous, linear-lanceolate, acuminate, striate, scarious, ciliate, about ½ in. long, the upper ones ovate, acute, and less ciliate; calyx shallow, more than a line across, the teeth short, 3-angular; corolla glabrous, more than ⅓ in. long; pods crowded, elongate linear-oblong, usually somewhat curved, dehiscent, densely covered with brown or tawny short stiff hairs, up to 1¼ in. long, flat, about 10-5-jointed, the articles about 2½ lin. long by 3 broad or almost quadrangular, with the outer suture straight and the inner rounded, each containing a single reniform-oblong glossy-olive-coloured and black-speckled seed.

Hab.—Frequent in the mixed forests, especially along the rocky or stony beds of choungs in the upper mixed forests, from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. close of R.S.; Fr. C.S.—1×s.—SS.=∞ SiS. All., etc.

Remarks.—Wood rather heavy, close-grained, soft, pale-greyish brown, of a silvery lustre.

13. **D. heterocarpum,** DC. (*D. polycarpum,* DC.; H.f. Ind. Fl. ii. 171).—A spreading shrub, 1 to 3½ ft. high and higher, the younger branchlets more or less pubescent or even pilose; stipules from a broad base linear, subulate-acuminate, scarious, striate, ⅓-½ in. long; stipulets subulate-filiform, about 2 lin. long; leaves pinnately 3-foliolate, on a more or less pubescent petiole ⅓ to ⅔ in. long; lateral leaflets somewhat smaller and slightly oblique, the terminal one obovate to obovate- and elliptically oblong, very shortly petioluled, blunt or rounded, ½ to 2 in. long, entire, chartaceous, glabrous above, beneath pale-coloured and more or less sparingly appressed pubescent or rarely pilose or silvery silk-hairy; flowers small, purple, usually with a yellow blotch at the base of the standard, on capillary puberulous about 3-2 lin. long pedicels, forming a rather short puberulous or sometimes pilose raceme at the end of the branchlets and in the axils of the leaves, the rachis usually appressed silvery pubescent; bracts very deciduous, ovate-lanceolate, subulate-acuminate, striate, fringed, 2-2½ lin. long; calyx glabrous, about a line long, the teeth linear-acuminate; corolla glabrous, nearly 3 lin. long; pods elongate linear-oblong, flat, glabrous, with the margins fringed, or sparingly and shortly stiff-hairy or hooked-hirsute, 3-9-jointed, the articles almost 4-angular, 1 to nearly 2 lin. long and broad, laxly net-veined, straight on the outer margin, rounded on the inner, each containing a single glossy black compressed seed.

Hab.—Common all over Burma from Chittagong and Ava down to Tenasserim, in all leaf-shedding forests, especially the mixed ones; entering also savannahs and cultivation.—Fl. close of R.S.; Fr. C.S.—1×s.—SS.=∞.

14. **D. retroflexum,** DC.; H.f. Ind. Fl. ii. 170.—A spreading shrub, 2 to 3 ft. high, all softer parts more or less silvery silk-hairy; stipules linear-lanceolate, subulate-acuminate, striate, sparingly pilose outside, up to ½ in. long; stipulets subulate, 2-3 in. long; leaves pinnately 3- or more usually 1-foliolate, on an appressed pilose petiole ½-⅔ in. long; leaflets of the compound leaves more obovate, of the simple ones almost orbicular, rounded or almost retuse with a mucro, entire, 1-1½ in. long, chartaceous, glabrous above, beneath densely silvery appressed pilose; flowers small, purple, on filiform about 3 lin. long glabrous or nearly glabrous reflexed pedicels, forming short sessile or almost sessile appressed pilose or pubescent racemes in the axils of the leaves and at the end of axillary branchlets; bracts ovate-acuminate, cuspidate, pilose-fringed, very deciduous; calyx pilose, about a line long, the lobes lanceolate-acuminate; corolla glabrous, about 2 lin. long; pods linear-oblong, minutely puberulous or glabrous, ciliate on the margins, laxly net-veined, 3-5-jointed, the articles about 2 lin. long or somewhat shorter, straight on the outer, rounded on the inner suture.

Hab.—Tenasserim.

ORMOCARPUM, P. B.

Calyx-tube bell-shaped, the upper teeth deltoid, the 3 lower lanceolate. Standard broad; keel much incurved, not beaked. Stamens united into 2 separate sheaths, the anthers uniform. Ovary few-ovuled; style filiform, inflexed, with a minute terminal stigma. Pod jointed, the joints turgid, indehiscent, glabrous or glandular-muricate, the basal one seedless.—Shrubs, with unpaired-pinnate leaves; stipules and bracts persistent, stipellets none. Flowers racemose.

1. **O. sennoides,** DC.; H.f. Ind. Fl. ii. 152.—An evergreen shrub, the young branchlets sticky-hairy; leaves unpaired-pinnate, 2-3 in. long, the rachis filiform, viscid-hairy; leaflets in 4-6 pairs with an odd one, very shortly petioluled, alternate, obovate or obovate-oblong, retuse, ⅓-½ in. long, membranous, glabrous; flowers long-pedicelled, middling-sized, yellow, in poor lax glandular-pubescent racemes in the axils of the leaves; calyx about 3 lin. long, sparingly viscid-hairy or almost glabrous; corolla 4 lin. long; pods moniliform-jointed, glandular-muricate, longitudinally furrowed, the joints lanceolate to linear-lanceolate, narrowed at both ends, ½-⅔ in. long.

Hab.—Adjoining provinces of Siam.

* * *Standard always inside in bud.*

CASSIA, L.

Sepals 5, somewhat unequal, much imbricate, the outer ones smallest, scarcely united at the base. Petals 5, spreading, nearly

equal or the lower outer ones rather larger. Stamens usually 10, free, either all nearly equal and perfect, or the 2 or 3 lower ones larger or on longer filaments and the 3 or 4 upper ones reduced to small staminodes; anthers when perfect opening in apical pores or in short lateral slits. Ovary with several ovules, incurved, tapering in a short style. Pod cylindrical or flat, indehiscent or 2-valved. Seeds oblong or obovate, transverse or horizontal. Albumen fleshy.—Trees, shrubs, or herbs, with abruptly pinnate leaves. Flowers in axillary or terminal racemes or solitary. Bracts often deciduous, bractlets none.

* *Filaments of the lower 3 stamens very long and arcuate, the others short or imperfect. Pods terete, long, indehiscent. Seeds horizontal, transverse.*

× Racemes drooping, destitute of bracts during flowering. Flowers yellow . . . . . *C. fistula.*

× × Racemes more or less erect, with persistent bracts. Flower pale or intensely pink-coloured. (Longer filaments node-like thickened at the middle.)

Leaflets short-acuminate . . . . . *C. nodosa.*

Leaflets pubescent, retuse or blunt . . . . . *C. renigera.*

* * *Perfect anthers 7 or 10, opening by terminal pores or slits. Pods compressed or more or less terete, opening along the one or both sutures.*

× Perfect stamens 7.

○ Pods not winged.

All full-grown parts glabrous; large tree . . . . . *C. Siamea.*

All parts pubescent; stipules deciduous; shrub or small tree . *C. Timoriensis.*

All parts pubescent; stipules large, lunate-reniform, rather persistent; shrub . . . . . *C. auriculata.*

○ ○ Pods broadly 4-winged; shrubby herb, glabrous; bracts large, yellow . . . . *C. alata.*

× × Perfect stamens 10; pods very flat, often sinuate-constricted between the seeds . . . . . *C. glauca.*

1. **C. fistula**, L.; Bedd. Sylv. Madr. 91; Brand. For. Fl. 164.—*Gnoo-kyee.*—A tree (30—50 + 10—25 + 3—6), shedding leaves in H.S., the very young shoots silk-hairy; bark grey, about ⅓ in. thick, smooth, occasionally peeling off in mealy thin flakes; cut dryish, red; leaves abruptly pinnate, while very young appressed sericeous, 1-1½ ft. long, the petiole and rachis terete; leaflets in 4-8 pairs, on thick 2-3 lin. long petioles, ovate to ovate-oblong, bluntish to bluntish acuminate, 3-5 in. long, thin coriaceous, when full grown glabrous, more or less glaucescent beneath; flowers large, yellow, on capillary 1½-2 in. long pedicels, forming long drooping glabrous slender racemes solitary or by pairs from the axils of the young leaves or from above the scars of the fallen ones; calyx very deciduous, velvety; petals obovate-oblong, about an inch long; filaments and ovary glabrous, the longer filaments not thickened at the middle; pods terete, 2-3 ft. long, at base contracted in a short stalk, black, smooth, chambered within, many-seeded; seeds ovoid, rather small, somewhat compressed, pale chestnut-brown, glossy.

Hab.—Frequent all over Burma and the adjacent provinces, in the leaf-shedding forests, especially in the savannah and lower mixed forests.—Fl. Apr.; Fr. C.S.—l.—SS.= ∞ *All. SiS.*

Remarks.—Wood pale reddish brown, the heart-wood dark-brown, rather heavy, coarse-fibrous, but rather close-grained, strong, elastic, but soon attacked by xylophages if not seasoned. □ '57 pd. Used for bows, axles of carts, ploughshares, rice-pounders, etc. Bark good for tanning.

2. **C. nodosa,** Ham.—*Gnoo-thein.*—A large evergreen tree, the very young shoots shortly pubescent; leaves abruptly pinnate, ½ to 1 ft. long, the rachis shortly puberulous; leaflets in 6-12 pairs, on a 1-2 lin. long puberulous petiolule, oblong to ovate-oblong, shortly acuminate, 1½ to 3 in. long, thin coriaceous, when full grown glabrous and glossy above, beneath indistinctly and shortly puberulous; flowers large, showy, pinkish, on 1½-2 in. long slender puberulous pedicels, forming erect solitary slightly puberulous short racemes solitary or by pairs in the axils of the leaves or more usually above the scars of the fallen ones; bracts persistent, pubescent, narrow-lanceolate; calyx velvety; petals oblong-lanceolate, rather acute, about an inch long; filaments glabrous, the 3 longer ones spherically thickened at the middle; ovary slightly villous; pods cylindrical, 1-1½ ft. long, at base contracted in a short stalk, smooth, chambered within, many-seeded.

Hab.—Evergreen tropical forests of Martaban down to Upper Tenasserim, rather rare; also Chittagong.—Fl. Apr.; Fr. C. S.—s.

3. **C. renigera,** Wall.—*Gnoo-shway.*—A leaf-shedding tree (30—40+8—15+3—5), the younger parts all softly and shortly pubescent; leaves abruptly pinnate, ⅓-1 ft. long, softly pubescent all over; stipules large, lunate-reniform, deciduous; leaflets in 8-20 pairs, very shortly petioluled or rather almost sessile, elliptically oblong to oblong, blunt or retuse with a minute mucro, ½-1½ in. long, membranous, softly and shortly pubescent; flowers large and showy, of a rich pink colour, on pubescent 1-1½ in. long pedicels, forming very short softly pubescent densely bracted racemes solitary or by pairs above the scars of the fallen leaves; bracts cordate-ovate, long-acuminate, softly pubescent; calyx shortly and densely pubescent; petals oblong, nearly an inch long, bluntish; ovary and filaments glabrous, the longer filaments incrassate at the middle; pods cylindrical, 1-2 ft. long, glabrous.

Hab.—Not unfrequent in the dry forests of Prome and Ava.—Fl. Apr.; Fr. Nov.—l.—SS.=CaS.

4. **C. Siamea,** Lamk.—*Maizalee.*—An evergreen or often leaf-shedding tree (50—60—10—35+3—6), remaining stunted on impermeable substrata, the young branchlets minutely downy; bark rather smooth, grey or blackish brown, slightly longitudinally fissured, brittle; leaves abruptly pinnate, ½-1 ft. long, the young rachis minutely downy; leaflets in 6-10 pairs, on a puberulous or

almost glabrous petiolule about a line long, oblong to elliptically oblong, more or less retuse with a minute mucro, 1½-2 in. long, entire, chartaceous, glabrous, or slightly downy and more or less glaucescent beneath; flowers rather small, yellow, on ½-1 in. long puberulous pedicels, forming longer or shorter peduncled puberulous often corymb-like racemes arranged in a terminal or axillary panicle; calyx almost glabrous; petals almost rotundate, shortly clawed, about ½ in. long; filaments glabrous; ovary shortly pubescent; pods elongate-linear, acuminate at both ends, 3-7 in. long, flat, both sutures thickened, velvety-brown, many-seeded; seeds somewhat pentagonally elliptical, very flat, blackish brown, glossy.

HAB.—Rather frequent in the mixed (especially the upper mixed) and dry forests, from Chittagong and Ava down to Tenasserim.—Fl. Nov.-Jan.; Fr. March-Apr.—l.—SS.= ∞ *SiS.*

REMARKS.—Sap-wood broad, white, coarsely fibrous, light; heart-wood ebony-like and almost black, often streaked, heavy and very close-grained, durable, takes fine polish.— □ =58 pd. Used for helves, walking-sticks, mallets, etc.

5. **C. Timoriensis,** DC.—*Toung-maizalee.*—An evergreen tree, (12—18+6—10+⅔—1), with a very spreading crown, all softer parts shortly appressed pubescent; leaves abruptly pinnate, ½-¾ ft. long, the rachis more or less pubescent; leaflets in 10-20 pairs, on a very short pubescent petiolule, oblong to narrow-oblong, blunt with a mucro, 1-1¼ in. long, entire, membranous, thinly appressed pubescent, more or less glabrescent above; flowers rather large, yellow, on ½-1 in. long shortly pubescent pedicels, forming short pubescent bracted racemes in the axils of the upper leaves and often collected into terminal panicles; bracts leafy, broad-ovate, acute, about ⅓ in. long, pubescent, longer persistent; calyx shortly pubescent; petals rotundate-obovate, shortly clawed, nearly ½ an in. long, the filaments very short, glabrous; ovary glabrous; pods elongate-linear, very flat, acuminate at both ends, smooth, black, transversely and slightly torulose; seeds very flat, glossy.

HAB.—Frequent all over Burma from Ava down to Tenasserim, in the mixed and dry forests, more especially along choungs in the upper mixed forests.—Fl. Sept.-Oct.; Fr. C.S.—s × l.—SS. = ∞ *SiS.*

6. **C. auriculata,** L.; Brand. For. Fl. 165.—A large shrub, 8-10 ft. high, the branchlets softly velvety pubescent; stipules large, cordate-semilunate, long-persistent; leaves abruptly pinnate, ¼-½ ft. long, the rachis shortly pubescent; leaflets in 8-12 pairs, very shortly petioluled or almost sessile, oblong, blunt with a mucro, ¾ in. long, entire, membranous, appressed pubescent, more or less glabrescent above; flowers large, yellow, on about an inch long shortly pubescent pedicels, forming a long-peduncled softly and shortly pubescent bracted few-flowered raceme in the axils of the leaves; bracts leafy, ovate to ovate-lanceolate, acuminate, 3-4 lin.

long, long-persistent; calyx glabrous or nearly so, the sepals ciliolate; petals obovate-rounded, shortly clawed, nearly an inch long; filaments glabrous; ovary shortly appressed pubescent; pods brown, 2-3 in. long, linear-oblong, at base narrowed in a short stalk, terminating in a long filiform style, very flat, shortly and rather thinly pubescent, 2-valved, the valves chartaceous, somewhat torose.

Hab.—Apparently frequent in the Irrawaddi valley of Ava.—Fl. Sept.-Febr.

7. **C. glauca,** Lamk; Bedd. Sylv. Madr. 91.—A large branchy shrub, 4-6 ft. high, the younger parts more or less appressed pubescent or rarely almost glabrous; leaves abruptly pinnate, ⅓-1 ft. long, the rachis more or less silky pubescent; leaflets in 4-10 pairs, on very short puberulous petiolules, from oblong to oval-oblong, bluntish or rounded, ½ to 2 in. long, entire, membranous, glabrous above, beneath more or less glaucous and usually also more or less appressed pubescent or rarely quite glabrous; flowers middling-sized, yellow, on filiform puberulous up to an inch long pedicels, forming puberulous corymb-like racemes in the axils of the leaves or collected at the end of the branchlets; bracts small, lanceolate, acuminate, long-persistent; calyx glabrous or nearly so; petals elliptically oblong, nearly an inch long; filaments glabrous; ovary silky pubescent; pods very flat and often sinuate-constricted, elongate-linear-oblong, at the rounded base constricted in a short stalk, blunt and terminated with a stylose bristle, 2-4 in. long, many-seeded, the valves black, thin coriaceous, transversely torulose, smooth; seeds flat, oblong, glossy brown.

Hab.—Not unfrequent in the dry forests, especially along the sides of rivers, of Ava and Prome; also much planted round khyoungs in Pegu, etc.—Fl. Fr. ∞.—l.—SS. = ∞.

BAUHINIA, L.

Sepals united at the base into a short or long disk-bearing tube, the free part separating into 5 or fewer valvate or induplicate lobes. Petals 5, inserted at the summit of the tube, usually clawed and more or less unequal. Stamens 10, free, either all perfect or some reduced to small staminodes. Ovary stalked (the stalk adnate to the one side of the calyx-tube) with several ovules; style usually filiform rarely short with a capitate broad or oblique terminal stigma. Pod linear or oblong, compressed, 2-valved. Seeds compressed. Albumen usually thin.—Trees or woody climbers, rarely erect shrubs, with either bifoliolate leaves or more usually the 2 leaflets united into one entire or 2-lobed palmately nerved blade. Flowers large or small, in terminal or rarely axillary often corymb-like racemes sometimes collected in a panicle.

* *Erect trees or shrubs.*
× Calyx spathaceous.
○ Fertile stamen 1 only, the rest sterile.
Young shoots pubescent; leaves puberulous; ovary stalked; pods unknown . . . . . *B. monandra.*
As former, pods sessile . . . . . *B. brachycarpa.*
○○ Fertile stamens 5.
Shrub; calyx ⅛ an in. long . . . . . *B. acuminata.*
Shrub; calyx only 3 lin. long . . . . . *B. polycarpa.*
Tree; calyx ½ an in. long . . . . . *B. variegata.*
○○○ All the 10 stamens fertile; flowers small . *B. racemosa.*
×× Calyx valvate, the segments reflexed and free, or only slightly cohering.
○ Stamens 10, 5, or more of them sterile. Calyx in bud angular. Flowers large and showy.
Leaves glabrous; flowers white or purple, the broader petal usually yellow at base . . . . . *B. purpurea.*
Leaves velvety; flowers yellow, turning orange . . . . *B. elongata.*
○○ All the 10 stamens fertile; stigma peltate; flowers small . . . . . *B. Malabarica.*
** *Woody climbers, often tendril-bearing. Calyx valvate in bud.*
× Leaves 2-foliolate; all 10 stamens fertile; calyx angular in bud . . . . . *B. diphylla.*
×× Leaves more or less deeply 2-lobed. Calyx terete in bud.
○ Ovary and pod glabrous. Calyx-tube and style elongate.
+ Ovary stalked.
Bractlets very large, almost leafy . . . . . *B. involucellata.*
++ Ovary sessile. Flowers small, corymbose.
Lobes of leaves rounded; pedicels and calyx glabrous . . . *B. glauca.*
Lobes of leaves acuminate; pedicels and calyx appressed silk-hairy *B. piperifolia.*
○○ Ovary, and usually also the pod, villous, pubescent or puberulous.
+ Pod and ovary sessile.
† Lobes of leaves acuminate to acute and bluntish; leaves glabrous.
Racemes elongate, appressed silk-hairy; pedicels stout . . . *B. macrostachya.*
Racemes corymb-like contracted, sparingly puberulous; pedicels slender . . . . . *B. ornata.*
†† Lobes of the tomentose or pubescent leaves rounded.
All parts brown-tomentose or pubescent; petals an inch long; racemes elongate . . . . . *B. Vahlii.*
++ Pod and ovary stalked.
Flowers rose-coloured, in corymb-like racemes; style shorter than the ovary, villous, thick . . . . . *B. rosea.*
Flowers yellowish white to yellow, in short racemes; style elongate and slender . . . . . *B. ferruginea.*
○○○ Ovary and pod glabrous; calyx-tube almost none, the lobes tooth-like; style very short . *B. anguina.*

* *Erect trees or shrubs.*

1. **B. monandra,** Kz.—*Swai-tan.*—Probably an erect shrub or tree, the young shoots shortly pubescent; leaves small, very like those of *B. tomentosa*, rotundate-oval, truncate at the base, on a shortly pubescent petiole ½-1 in. long, down to ⅓ 2-lobed, with the

lobes rounded and bearing a bristle in their sinus, 1-1½ in. long, entire, chartaceous, glabrous above, beneath (especially along the 11 palmate nerves) shortly pubescent; flowers rather large, white (?), with the lower petal spotted, on 1-1¼ in. long shortly but densely pubescent pedicels, forming short terminal pubescent racemes; bracts subulate, small; calyx shortly tomentose outside, spindle-shaped in bud, spathaceous; petals obovate-cuneate, about 1¼ in. long, glabrous, waved; perfect stamen 1 only, all others rudimentary; ovary stalked, tawny villous (the sutures smooth and glabrous), terminated by a slender style twice as long as the ovary itself.

HAB.—Martaban.

2. **B. brachycarpa,** Wall.—"Glabrous or minutely scabrous-puberulous; leaflets connate to ⅔ of their length, oval, blunt, parallelly 4-5-nerved, on an angular petiole; racemes short, many-flowered; flowers pedicelled; pods sessile, broadly linear, acuminate, minutely tomentose; flowers unknown." (Accord. Benth.)

HAB.—Ava.

3. **B. acuminata,** L.—*Ma-ha-hlay-ka-phyoo.*—An erect shrub, 2-6 ft. high, the young shoots slightly pubescent; leaves cordate-rotundate, 2-cleft to about ⅓ of their length, with the lobes acute or bluntish, with or without a short bristle in their sinus, on a 1-1½ in. long usually glabrous petiole, 2-4 in. long and nearly as broad, entire, chartaceous, glabrous above, beneath conspicuously transversely veined and net-veined, minutely puberulous; flowers large, showy, pure white, or sometimes the base of the petals yellow, on ½-1 in. long indistinctly pubescent glabrescent subulate-bracted pedicels, forming short, more or less corymb-like, leaf-opposed and terminal, almost glabrous racemes; bracts subulate; calyx minutely and sparingly appressed pubescent, spathaceous, about ½ an in. long, long-acuminate and setaceously 5-toothed, terete in bud; petals more or less oblong, nearly an inch long, glabrous; stamens 10, 5 longer; pods linear-lanceolate, contracted in a slender ½-¾ in. long stalk, laterally acuminate, 2-3 in. long, glabrous, rather flat, pale-brown, slightly torose, along the seed-bearing suture broader and thickened into 2 marginal keels, 8-12-seeded; seeds oblong to ovoid, somewhat compressed, brown, glossy.

HAB.—Frequent in the open forests, especially the Eng forests, all over Burma.—Fl. March-May; Fr. C.S.—l.—SS. = Dil. *Arg.*

4. **B. polycarpa,** Wall.—A simple or almost simple shrub, 1-3 ft. high, glabrous or the young shoots slightly and sparingly appressed-pubescent; leaves more or less cordate-rotundate, 2-lobed up to ⅓ of their length, with the lobes rounded or somewhat acute and a short bristle in their sinus, on a slender 1-1½ in. long petiole,

3-5 in. long, palmately 7-9-nerved, entire, thin chartaceous, glabrous, somewhat glaucescent beneath; flowers small, white, on hardly a line long pedicels forming a very slender minutely pubescent leaf-opposed raceme; bracts minute, acute; calyx glabrous, saccate-spathaceous, acute to acuminate, only 3 lin. long, terete in bud; petals nearly conform, concave, obovate-oblong, retuse, erect-conniving, sessile, glabrous; stamens 10, 5 of them doubly longer; pods linear-lanceolate, acuminate at the base, almost sessile, 1-2½ in. long, flat, smooth or slightly wrinkled-nerved, the seed-bearing suture narrow, 2-sulcate, 4-6-seeded; seeds oblong, small, glossy-black.

Hab.—Frequent in the upper mixed forests from Pegu and Martaban down to Upper Tenasserim.—Fl. Apr.-May; Fr. C.S.—1.—SS. = *SiS.* Metam.

5. **B. variegata,** L.; Bedd. Sylv. Madr. 92; Brand. For. Fl. 160.—*Bwé-cheng.*—A tree (25—30 + 6—15 + 2—4), leafless in H.S., the young branchlets puberulous; leaves cordate-rotundate, 2-cleft to ⅓-½ of their length, with the lobes rounded and a short subulate bristle in their sinus, 2-4 in. long, on a ½-1 in. long geniculate-thickened petiole at summit, entire, glabrous, palmately 9-11-nerved; flowers large and showy, pale purplish to white with the larger petal often orange to yellow or purplish blotched, on strong up to ½ an in. long naked (not bracted) velvety-tomentose pedicels, arranged into a very short minutely bracted corymb-like velvety raceme above the scars of the fallen leaves and at the end of the branchlets; calyx slit, spathaceous, about ½ an in. long, terete in bud, the apex indistinctly 5-toothed; petals about an inch long or longer, from broadly ovate-oblong to lanceolate, strongly nerved, acute to acuminate, glabrous; fertile stamens 5; pods linear-lanceolate, narrowed in a 1-½ in. long stalk, acuminate, 4-6 in. long, glabrous and rather smooth or minutely obliquely wrinkled, black, many-seeded; seeds ovoid, rather flat, pale-coloured.

Hab.—Common in the dry forests, especially the upper ones, of Prome and Ava, up to 3,200 ft. elevation; also Yoonzeleen, Martaban.—Fl. Febr.-March; Fr. C.S.—1.—SS. = CaS.

6. **B. racemosa,** Lamk.; Bedd. Sylv. Madr. t. 182; Brand. For. Fl. 159.—*Hpalan.*—A tree (25—30 + 8—15 + 3–4), shedding leaves in H.S., the young shoots tawny pubescent; leaves broadly cordate-rotundate, on a ½-1 in. long pubescent petiole, shortly 2-lobed, with the lobes rounded and a bristle in their sinus, 1-3 in. long, entire, chartaceous, beneath slightly appressed pubescent, more or less glabrescent and glaucescent; flowers small, white, on 2-3 lin. long pubescent pedicels, forming softly and shortly pubescent racemes at the end of the branchlets; bracts minute; calyx shortly pubescent, the tube short and hemispherical, the lobes in bud ovate-acute,

almost terete, spathaceously opening, about 3 lin. long; petals linear-lanceolate, acute, very unequal, the lower longer one about 5 lin. long, slightly pubescent; ovary glabrous; pods more or less curved, elongate-linear-oblong, tapering in a short stalk, thick, but rather flat, ½-¾ ft. long, woody coriaceous, glabrous, black; seeds oval, brown, shining.

Hab.—Common in the dry forests of Prome, entering also the savannah forests.—Fl. Fr. March,-Apr—l.—SS. = *CaS.* All.

Remarks.—Wood dark-brown, mottled, rather light, fibrous, but rather close-grained; the heart-wood very hard; takes fine polish. □′ = 44 pd. Bark used for slow matches by matchlockmen in India; ropes can also be made from it.

7. **B. purpurea,** L.; Bedd. Sylv. Madr. 92; Brand. For. Fl. 160.—*Ma-ha-lay-ka-nee.*—A tree (25—30 + 8—10 + 2—3), leafless in H.S., glabrous, or the young branchlets minutely velvety; leaves more or less cordate-rotundate, to the middle 2-cleft, with the lobes blunt and subulate-pointed in the sinus, on a 1-2 in. long glabrous petiole thickened at the apex, 3-4 in. long and nearly as broad, 5-7-nerved, chartaceous, glabrous; flowers rather large and showy, from purple to bluish white, the anterior petal often with a yellowish blotch at base, on 3 to 5 lin. long minutely bracted tawny velvety pedicels, forming terminal or rarely also axillary simple or branched tawny velvety racemes; calyx tawny velvety, angular in bud, the tube 3-4 lin. long and very narrow, the lobes somewhat constricted at the base and opening usually variously into 2 unequal ⅔ in. long sheaths; petals from obovate-lanceolate to almost lanceolate, waved, more or less acute, about an inch long or longer, glabrous; ovary appressed tawny villous; fertile stamens 3 or 4; pods elongate-linear, 5-6 in. long, tapering into an inch long stalk, acuminate, glabrous, black, almost smooth, many-seeded; seeds compressed, ovoid, pale-brown.

Hab.—Here and there cultivated in Ava and Pegu.—Fl. C.S.

8. **B. elongata,** Korth.—An evergreen tree, about 20-30 ft. high, all softer parts velvety; leaves cordate-rotundate, 2-lobed to ¼-⅓ of their length, with the lobes rounded and a short bristle in their sinus, on a ½-1 in. long more or less puberulous petiole, 2½-4 in. long and broad, entire, chartaceous, minutely velvety all over, palmately 11-13-nerved; flowers middling-sized, yellow, turning orange, on ½-1 in. long sulcate strong velvety pedicels, forming a short velvety raceme opposite the leaves and at the end of the branchlets; bracts minute; calyx about an inch long, velvety, 5-angular in bud, the lobes linear, more or less separating into 4 cohering and a single free sepal and reflexed; petals about an inch long or longer, linear-lanceolate to lanceolate, acuminate, long-tapering at the base, sparingly puberulous; pods oblong-lanceolate, laterally acuminate, narrowed into a stalk, 2-3 in. long, brown, pubescent.

Hab.—In the tropial forests above Rangoon, and Tenasserim down to Tavoy. —Fl. Decr.-Jan.—s.

9. **B. Malabarica,** Roxb.; Bedd. Sylv. Madr. 92; Brand. For. Fl. 159.—An evergreen tree (30—40 + 12—20 + 5—6), the very young shoots minutely puberulous; bark rough, dark-grey or brownish; cut red; leaves more or less rotundate-cordate, on a puberulous glabrescent petiole 1-1½ in. long, shortly 2-lobed, with the lobes rounded and a bristle in their sinus, 2½-3 in. long and rather broader, entire, chartaceous, glabrous, somewhat glaucous beneath, usually palmately 9-nerved; flowers small, white, on slightly puberulous 3-4 lin. long pedicels, forming short minutely bracted puberous simple or branched racemes in the axils of the leaves and at the end of the branchlets; calyx minutely puberous, the tube conical and short, the limb 5-toothed, ovoid in bud; petals glabrous, somewhat longer than the calyx, obovate-cuneate, about 3 lin. long; ovary and the short style tawny-tomentose, the latter terminated by a large peltate stigma; pods 1-1¼ ft. long, linear, acuminate at both ends and narrowed into an inch long stalk, very flat and often bullate-undulate, strongly and conspicuously net-veined, glabrous, blackish, coriaceous, many-seeded; seeds small, blackish-brown, ovoid-oblong.

Hab.—Frequent in the upper and lower mixed forests of the Pegu Yomah, rarely entering the savannah forest.—Fl.-Fr. C. S.—l.—SS.=*SiS.* All.

Remarks.—Wood used for the cross-pieces of harrows, house-posts, etc.

* * *Woody climbers, often tendril-bearing.*

10. **B. diphylla,** Symes.—A large tendril-bearing, scandent shrub, all parts quite glabrous; leaves on a ½-1 in. long petiole (the bristle seated on the back of the thickened apex), 2-foliolate down to the base; leaflets unequally oval-oblong, more or less truncate at the base, rounded at the apex, sessile, 1-3 in. long, 5-6-nerved, thin coriaceous, glabrous, a little glaucous beneath; flowers large, white, on strong 1-2 in. long pedicels, forming a terminal robust glabrous raceme at the end of the branchlets; calyx glabrous, about an inch long or somewhat longer, the lobes in bud elongate-oblong, then linear-oblong and free to nearly one-half of their length, reflexed, separating in an obliquely cut tube; petals about ⅓ longer than the sepals, linear-lanceolate, tapering, undulate; stamens 10, all perfect; ovary smooth; pods very flat, elongate-oblong, rather chartaceous, varying from ½ to 2 ft. in length by 1-2½ in. broad, with somewhat thickened borders contracted in a 1-2 in. long stalk, transversely but thinly net-veined, glabrous, brown; seeds between pithy partitions, oblong, slightly compressed, brown, smooth and glossy.

Hab.—Frequent in the dry forests of Ava and Prome.—Fl. R.S.; Fr. ∞—l.—SS.=CaS.

11. **B. involucellata,** Kz.—A scandent shrub, the young shoots slightly puberous; leaves cordate-ovate, on a glabrous 1½-2 in. long petiole, 2-lobed to ½-⅔ of their length, with the lobes bluntish acuminate and a bristle in their sinus, 3-4 in. long, entire, thin chartaceous, glabrous, palmately 9-11 nerved; flowers rather large, pale rose-coloured, on 2-2½ in. long shortly puberulous glabrescent pedicels conspicuously 2-bracteoled below the apex and forming a longer or shorter terminal puberulous glabrescent raceme; bracts minute, indistinct; bractlets below the calyx elliptically oblong, bluntish, ½ in. long, velvety inside, forming a 2-leafed involucellum to each flower; calyx velvety, the tube tubular, sulcate, about 3 lin. long or longer, the lobes in bud oblong-ovate, lanceolate, acuminate, ⅓ in. long, all separating and afterwards reflexed; petals nearly 1½ in. long, the blade ovate-oblong, blunt, as long as the claw; ovary smooth, the style rather long, but thick; fertile stamens 3.

Hab.—Martaban.

12. **B. glauca,** Wall.—A scandent evergreen shrub, the young shoots appressed rusty pubescent; leaves rotundate-oval, 2-lobed to more than ½ of their length, with the lobes rounded and a bristle in their sinus, on a slender about 1-½ in. long while young slightly pubescent petiole, 2-3 in. long and broad, entire, chartaceous, glabrous, while young slightly rusty pubescent along the 9-11 palmate nerves and somewhat glaucescent beneath; flowers small, on very slender about ½ in. long minutely puberous 2-bracteolate pedicels, forming a corymb-like longer or shorter peduncled minutely rusty puberulous bracted raceme lateral or at the end of the branchlets; bracts setaceous; calyx glabrous, the tube cylindrical, about ½ an in. long, the lobes globular in bud, ovate, about 2 lin. long, reflexed; petals obovate, glabrous or slightly pubescent outside, about 3 lin. long; ovary smooth; pods broadly oblong, very flat, chartaceous, 5-8 in. long by 2 broad, with somewhat thickened sutures, contracted in a very short stalk, glossy black, and slightly transversely nerved.

Hab.—Tropical forests above Rangoon; Tenasserim, apparently frequent. —Fl. March-June; Fr. Febr.

13. **B. piperifolia,** Roxb.—A large scandent evergreen shrub, the very young shoots minutely puberous; leaves cordate-ovate, 2-lobed down to ⅓ of their length, with the lobes converging, bluntish acuminate and a short bristle in their sinus, on a ½-1¼ in. long puberous or glabrous petiole, 3-4 in. long, thin chartaceous, entire, glabrous or slightly pubescent along the palmate 7-9 nerves beneath, turning black and glossy in drying; flowers white, rather small, on slender 1-1¼ in. long tawny silk-hairy pedicels, forming corymb-like bractless tawny silk-hairy racemes in the axils of the upper leaves and often several together collected in a sort of terminal corymb; calyx in bud

globular, tawny-silk-hairy, the limb deeply 5-lobed, the lobes afterwards reflexed into 2 bilobulate and 1 simple segments; petals rotundate-obovate, undulate, about 2½ lin. long, densely rusty villous; perfect stamens 3; ovary smooth; pods, according to Roxburgh, round or oval, glabrous, 1- to 2-seeded.

Hab.—Tenasserim.

14. **B. macrostachya,** Wall.—A large evergreen scandent shrub, all parts glabrous or the young shoots indistinctly puberulous; leaves cordate to cordate-ovate, 2-lobed down to ¼-⅓ of their length (the lobes bluntish acuminate, rather remote, and a short bristle in their sinus) on a 1-1½ in. long petiole, entire, 3-4 in. long, thin chartaceous, palmately 7-11-nerved, glabrous or slightly puberulous on the nerves beneath; flowers rather small, white, on ½ to ⅔ in. long tawny mealy-velvety pedicels, forming a longer or shorter at the base usually tendril- and leaf-bearing raceme in the axils of the upper leaves and often collected in a more or less ample tawny-velvety panicle; bracts minute, acute; calyx tawny-velvety, about 2 lin. deep, shortly 5-lobed, the lobes blunt, in bud almost spherical; petals densely villous-velvety, rotundate, clawed, about 3 lin. long; ovary densely rusty-villous; pods oblong, very shortly stalked, acute, flat, shortly rusty or tawny-velvety.

Hab.—Burma, without locality.

15. **B. ornata,** Kz.—*Myouk-hlay-ka.*—A large evergreen scandent shrub, the young shoots rusty-pubescent; leaves cordate-ovate to cordate-rotundate, on a 1½-3 in. long petiole while young rusty pubescent, 2-lobed down to ½-⅓ of their length (the lobes bluntish to bluntish acuminate and a bristle in their sinus), 4-7 in. long and nearly as broad, entire, chartaceous, while young slightly appressed pubescent beneath, soon quite glabrescent, palmately 11-15-nerved; flowers small, white, on slender 1-1½ in. long rusty-pubescent pedicels, crowded and forming a longer or shorter peduncled bracted tawny pubescent corymb-like raceme arising laterally or at the end of the branchlets; bracts linear-lanceolate, pubescent, about 2 lin. long; calyx in bud pyriform, appressed pubescent, the lobes ovate, about 3 lin. long, reflexed; petals obovate-oblong, slightly pubescent outside, slightly waved, about 4 lin. long; ovary tawny villous, the style long and slender, glabrous.

Hab.—Frequent in the tropical forests along choungs, along the eastern slopes of the Pegu Yomah.—Fl. Febr.—s: L.—SS.=SiS.

16. **B. Vahlii,** W.A.; Brand. For. Fl. 161.—A large tendril-bearing scandent shrub, all softer parts rusty-pubescent; leaves cordate-rotundate, 2-lobed down to ½-⅓ of their length (the lobes rounded and a longer or shorter bristle in their sinus), 3-5 in. long and broad,

on a rusty-pubescent petiole 1-3 in. long, entire, chartaceous, above slightly, beneath densely rusty-pubescent, palmately 11-13-nerved; flowers rather large, white, turning yellowish, on slender 1½-2 in. long rusty-pubescent pedicels, forming a corymb-like shorter or longer peduncled rusty or tawny villous raceme at the end of the branchlets; bracts linear-lanceolate, acuminate; calyx appressed pubescent, terete and ovoid in bud, the tube tubular, the lobes ovate-lanceolate, about 4 lin. long, reflexed into 2 unequally cohering spathes; petals nearly an inch long, long-clawed, obovate, crispate-waved, slightly pubescent outside; ovary villous, the long slender style glabrous; pods obovate-oblong, about ½-1 ft. long by nearly 2 in. broad, flat, almost sessile, woody, shortly tawny or rusty tomentose; seeds very flat, large.

HAB.—Upper Tenasserim.

17. **B. rosea,** Kz.—A scandent shrub, the younger parts shortly tawny pubescent; leaves cordate-rotundate, 2-lobed to about ⅓ of their length (the lobes rounded and a short bristle in their sinus) on a 1½ to 2 in. long puberulous petiole, 3-5 in. long and nearly as broad, entire, chartaceous, while young fugaceously puberulous above, beneath shortly tawny puberulous; flowers rather small, rose-coloured, on slender appressed puberulous 1½-2 in. long pedicels, forming a bracted corymb-like tawny puberous raceme at the end of the branchlets; bracts linear-lanceolate, acuminate, about 4 lin. long; calyx tawny appressed puberulous, with a short tube, in bud terete-ovoid, the lobes all separating and reflexed, 4 lin. long, linear-lanceolate; petals long-clawed, obovate-linear, waved, slightly appressed pubescent on both sides, about ⅔ in. long; ovary along with the thick short style (shorter than the ovary) tawny villous.

HAB.—Martaban, in the Eng forests of Kaymapyo choung.—Fl. May.

18. **B. ferruginea,** Roxb.—A large evergreen scandent shrub, the young parts softly appressed rusty pubescent; stipules oboval, appressed pubescent, deciduous; leaves more or less cordate-rotundate, 2-lobed down to ⅓, with the lobes rounded and bearing a short bristle in their sinus, on a ½-1 in. long petiole which is rusty villous while young, 2-3 in. long and nearly as broad, entire, chartaceous, while young appressed rusty-pubescent, soon glabrescent and somewhat glaucous beneath, palmately 5-15-nerved; flowers rather large, yellowish white to yellow, sometimes tinged with orange, on strong slightly pubescent bractless pedicels up to ½ an in. long, forming a rather short terminal pubescent and glabrescent raceme; calyx minutely tawny puberulous, the tube nearly ½ an in. long, somewhat sulcate-cylindrical, in bud somewhat angular and elongate, the lobes linear-lanceolate, acute, about ¾ in. long; petals linear-lanceolate, long-tapering at the base, rusty appressed-villous outside;

pods elongate-oblong-lanceolate, long-stalked, nearly ½ a ft. long by 1½ in. broad, flat, shortly rusty pubescent.

HAB.—Tropical forests of the Martaban hills east of Tounghoo, at 2,000 to 3,000 ft. elevation.—SS.=Metam.

19. **B. anguina,** Roxb.—A lofty evergreen scandent shrub, the stems ribbon-like compressed, serpentine and fluted, glabrous, or the very young shoots slightly appressed rusty pubescent; bark brown, rather smooth; leaves cordate-ovate, simple, with a short bluntish 2-lobed apex, or down to ⅕-¼ of their length 2-lobed (the lobes bluntish acuminate and a bristle in their sinus) on a 1-2½ in. long petiole, 2-6 in. long, entire, chartaceous, when full grown quite glabrous; flowers minute, white, on slender puberous 2-3 lin. long pedicels forming puberulous racemes usually arranged into terminal panicles; bracts or bractlets none; calyx glabrous or nearly so, without a tube, urceolate-cup-shaped, unequally 5-toothed, nearly a line in diameter; petals glabrous, obovate, about a line long; ovary glabrous; pods 1-1¼ in. long, 1-2-seeded, oblong, flat, acute at both ends and narrowed into a slender but very short stalk, glabrous.

HAB.—Not unfrequent in the tropical forests of Martaban east of Tounghoo; also Chittagong.—s: l.—SS.=Metam.

REMARKS.—Wood coarse-fibrous, brown, perishable.

PARKINSONIA, L.

Calyx 5-cleft nearly to the base, the segments almost equal, slightly imbricate in the bud. Petals 5, 4 of them almost sessile, the fifth anticous one-clawed and standard-like. Stamens 10, free, scarcely declinate; anthers conform. Ovary narrowed at the base, with 8-15 ovules; style almost filiform with a minute terminal stigma. Pod narrow-linear, usually slightly constricted between the distant seeds, indehiscent, 1-8-seeded. Seeds albuminous.—Trees or shrubs, usually armed with sharp thorns, the leaves sessile or nearly so, 2-pinnate, the rachis flat and much dilated, the leaflets minute or quite suppressed. Flowers rather small, in axillary racemes. Bracts very deciduous.

1. **P. aculeata,** L.; Bedd. Sylv. Madr. 91, t. 13, f. 2; Brand. For. Fl. 158.—An evergreen tree (25—30+8—15+3—4), the branches armed with paired, straight, sharp stipulary thorns, all parts quite glabrous; leaves sessile, 2-pinnate, and appearing as if consisting of 2 elongate flattened slightly repand rachises of 1-2 ft. in length, which are more or less sparingly and interruptly beset with minute almost sessile oblong-lanceolate acute leaflets or the latter often enough quite aborted; flowers rather small, yellow, on capillary long pedicels up to an inch long, forming glabrous racemes in the

axils of the leaves; calyx glabrous; pods 1½-4 in. long, linear, acuminate at both ends, slightly moniliform, glabrous, longitudinally nerved.

HAB.—Frequently cultivated in Ava and the Prome district, and sometimes half-spontaneous in neglected village-woods, etc.—Fl. Fr. nearly ∞, especially C. and H.S.—SS.=CaS. Ca. All.

POINCIANA, L.

Calyx-tube short-turbinate, persistent; segments 5, nearly equal valvate in bud, deciduous. Petals 6, nearly equal, clawed, imbricate. Stamens 10, free, declinate; anthers conform. Ovary sessile or narrowed at the base, with many ovules; style filiform with a terminal somewhat dilated stigma; pods flat, 2-valved, several- to many-seeded. Albumen thin.—Unarmed trees, with abruptly bipinnate leaves. Stipulets none. Flowers showy, in terminal corymb-like racemes.

1. **P. regia,** Boj.; Bedd. Sylv. Madr. 91.—A tree (30—40 +8—15+3—5), evergreen or shedding leaves for a very short period in H.S., the very young shoots appressed silk-hairy, leaves abruptly bipinnate, ½-1 ft. long or somewhat longer, with 8 to 15 pairs of pinnæ, while young somewhat appressed silk-hairy; leaflets in 15-20 pairs, almost sessile, oblique at the base, linear-oblong, blunt, ⅓-½ in. long, when full grown glabrous, membranous; flowers large, crimson to scarlet, on 1-2½ in. long pedicels, forming short glabrous corymb-like racemes at the end of the branchlets; calyx smooth, the lobes oblong-lanceolate, acute, nearly an inch long; petals waved, very large; filaments slightly pubescent at the base; ovary almost glabrous; pods 1-2½ ft. long, broadly linear, flat, sessile, obliquely acuminate, glabrous, many-seeded; seeds ⅔ in. long, almost cylindrically oblong and only slightly compressed, brown and white variegated.

HAB.—Frequently cultivated in European stations all over Pegu.—Fl. Begin. of R.S.; Fr. C.S.

REMARKS.—Wood white, light, soft and loose-grained, takes a fine polish; exudes plenty gum.

CÆSALPINIA, L.

Calyx-lobes 5, imbricate in the bud, the lowermost often larger. Petals 5, nearly equal or the upper one smaller. Stamens 10, free; anthers uniform. Ovary sessile or nearly so, inserted at the base of the short calyx-tube often few-ovuled; style usually filiform with a terminal stigma. Pod various, more or less compressed, 2-valved or slowly dehiscent or indehiscent. Seeds transverse, usually separated by cellular partitions, without or (in *C. pulcherrima*) with

albumen.—Shrubs, often scandent, rarely trees, with or without prickles, the leaves abruptly bipinnate. Flowers often showy, in simple or panicled racemes.

* *Stamens as long or a little longer than the petals. Seeds without albumen. Scandent prickly shrubs, rarely small trees.*

× Pods rigidly or thinly coriaceous, dehiscent or not.

○ Pod-valves smooth.

† Seeds flat-compressed; pods 2-valved, glabrous; leaflets large . . . . . *C. nuga.*

†† Seeds hardly compressed. Leaflets small.

Small tree; leaflets unequally oblong, retuse; pods hardly dehiscing . . . . . *C. sappan.*

Scandent shrub; leaflets ovate, acute; pods 2-valved . . . *C. sepiaria.*

○ ○ Pod-valves echinate or glandular-hirsute.

† Pods echinate. Seeds almost globular.

The branchlets, etc., more or less brown or tawny pubescent; stipules large, pinnatifid . . . . . *C. Bonduca.*

†† Pods glandular-hirsute, at least when not fully ripe. Seeds oblong.

All parts more or less glandular-puberulous and prickly . . *C. mimosoides.*

× × Pods fleshy-coriaceous, torose, with thickened sutures, indehiscent.

Panicle shortly tomentose and prickly . . . . . *C. tortuosa.*

Panicle smooth and unarmed . . . . . *C. digyna.*

* * *Stamens very long and slender. Seeds albuminous.*

Erect unarmed shrub, quite glabrous . . . *C. pulcherrima.*

1. **C. nuga,** Ait.—*Soo-kouk.*—A large scandent prickly shrub, all parts quite glabrous; leaves abruptly bipinnate, ½-2¼ ft. long, with 2-5 pairs of pinnæ, the rachises all prickly; leaflets in 2-3 pairs, ovate-oblong to elliptical, very shortly and bluntish acuminate or apiculate, 1-2 in. long, entire, coriaceous, smooth, glossy above, beneath pale-coloured and opaque; flowers middling-sized, yellow (the standard often red-tinged), on 3-4 lin. long pedicels, forming a rather slender glabrous raceme in the axils of the leaves or the racemes collected in a terminal panicle; calyx glabrous; pods almost falcate-ovate or elliptical, acute at both ends, glabrous, 2-valved, slowly dehiscing, coriaceous, the valves rather flat; seeds elliptical, much compressed.

Hab.—Rather frequent in the jungles all along the coast from Arracan down to Tenasserim and the Andamans.—Fl. May-Octob.

2. **C. sappan,** L.; Bedd. Sylv. Madr. 90, t. 13, f. 1.—*Teing-nyet.*—A small bushy thorny tree (25—30 + 8 + 2), the young shoots puberulous; leaves abruptly bipinnate, 1¼-2½ ft. long, with 10 to 13 pairs of pinnæ, the rachises thorny and glabrescent; leaflets 7-20 pairs, unequally elliptically oblong, retuse, about ½ in. long, minutely puberulous and dotted beneath; flowers showy, yellow (the standard with a red blotch), on slender pedicels up to an inch long, racemose, forming a terminal shortly rusty-pubescent panicle; calyx slightly pubescent; filaments woolly at the base; pods almost

falcate-oblong, acuminate, about 2 in. long, 2-valved, the valves rather flat, smooth; seeds compressed.

HAB.—Frequent in Tenasserim; Pegu, above Rangoon.—Fl. Aug.

REMARKS.—A red dye-wood called sappan-wood, an important article of commerce.

3. **C. sepiaria,** Roxb.; Brand. For. Fl. 156.—*Soo-kyin-bo.*—A large thorny scandent shrub, the branchlets rusty or tawny puberulous; leaves abruptly bipinnate, 1-1½ ft. long, with 6 to 10 pairs of pinnæ, the rachis prickly and minutely puberulous; leaflets in 8 to 10 pairs, oblong to linear-oblong, almost sessile, blunt, ½ to ¾ in. long, slightly appressed pubescent on both sides, in a dried state canescent beneath; flowers showy, yellow, on stiff about an inch long tawny or greyish velvety pedicels, forming a tawny or greyish velvety somewhat prickly raceme in the axils of the leaves and at the end of the branchlets; calyx petaloid, yellow, velvety; petals minutely puberulous outside; filaments white-woolly; pods oblong, sessile, terminating in a long lateral stylose acumen, rather compressed, with somewhat thickened borders, transversely nerved, about 2 in. long, the valves firmly coriaceous, brown, glabrous; seeds 4-8, obovate-oblong, brown and variegated, not compressed.

HAB.—Burma (no locality).

4. **C. Bonduca,** Roxb.; Brand. For. Fl. 156.—*Kalein.*—A large scandent prickly shrub, all parts more or less thinly brown or tawny tomentose; stipules large, pinnatifid; leaves abruptly bipinnate, 2-3 ft. long, with 3 to 10 pairs of pinnæ, the rachises all prickly armed and shortly tomentose; leaflets in 6-10 pairs, elliptical to elliptically oblong, almost sessile, blunt with a mucro, ⅔-1 in. long, chartaceous, while young on both sides shortly puberulous, more or less glabrescent above; flowers middling-sized, yellow (the standard usually red-tinged towards the base), on ⅓-½ in. long tomentose pedicels, forming a simple or branched rusty or brown-tomentose raceme in the axils of the leaves; calyx, base of petals, and filaments rusty tomentose; pods elliptical to elliptically oblong, blunt, about 2-3 in. long, 2-valved, the valves rather convex, puberulous and covered with subulate prickles; seeds globular, grey, smooth.

HAB.—Not unfrequent in the leaf-shedding forests from Prome and Martaban down to Tenasserim and the Andamans.

5. **C. mimosoides,** Lamk.—A large prickly scandent shrub, the branchlets densely glandular-puberulous and prickly; leaves abruptly bipinnate, 1 to 3 ft. long, with 12-24 pairs of pinnæ, the rachis puberulous and recurved prickly; leaflets in 8-16 pairs, sessile, unequally oblong to elliptically oblong, 3-5 lin. long, blunt, pubescent, membranous; flowers rather showy, yellow, on ½ an in. long or

somewhat longer prickly and glandular-pubescent slender pedicels, forming long, rather stiff, glandular-pubescent, prickly racemes in the axils of the leaves and terminal; calyx glandular-pubescent; filaments white-woolly; pods unequally and almost falcate-oblong, incurved-pointed, more or less turgid, 1½-2 in. long, usually 2-seeded, the valves thin coriaceous, rigid, brown, especially while young hirsute; seeds oblong, not compressed, smooth, glossy dark-brown.

HAB.—Pegu, about Tounghoo, in shrubberies.—Fl. Fr. March-Apr.—l.—SS. = Lat. *Arg.*

6. **C. tortuosa,** Roxb.—A large prickly scandent shrub, the young shoots rusty puberulous; leaves abruptly bipinnate, 1-1½ ft. long, with 15 to 20 pairs of pinnæ, the rachises minutely rusty tomentose and prickly; leaflets in 20-40 pairs, almost falcate-linear to oblong, unequally rounded at the base, blunt or almost retuse, about ½ an in. long, chartaceous, glabrous, while young slightly appressed-pubescent beneath; flowers showy, yellow, with red centre, on slender about ½ in. long pedicels, forming simple more or less prickly and minutely puberulous glabrescent racemes in the axils of the leaves; calyx and corolla glabrous; filaments rusty-villous; pods linear-oblong, torose, considerably twisted, coriaceous, smooth.

HAB.—Tenasserim.—Fl. Octob.

7. **C. digyna,** Rottl.—*Soon-let-thai.*—A large scandent prickly shrub, the branchlets minutely puberulous or velvety; leaves abruptly bipinnate, ½-¾ ft. long, with 5-9 pairs of pinnæ, the rachis minutely and slightly puberulous or glabrous, sparingly prickly; leaflets in 6-10 pairs, unequally oblong, oblique at the base, almost sessile, blunt, up to ½ an in. long, glabrous, membranous, pale-coloured beneath; flowers middling-sized, yellow (the petals often reddish at the base), on very slender about an inch long pedicels, forming rather long glabrous racemes in the axils of the leaves; calyx and corolla glabrous; filaments white (when dry tawny), woolly; ovary glabrous; pods 1-2 in. long, glabrous, torulose, oblong-lanceolate, 1-3-seeded, coriaceous and tardily dehiscing in two valves; seeds oblong, not compressed, black.

HAB.—Frequent all over Burma from Ava and Martaban down to Tenasserim, especially in shrubberies around villages and along choungs in open forests.—Fl. July-Octob.; Fr. Jan.-Apr.—l.—SS. = ∞. *Dil.*

8. **C. pulcherrima,** Sw.; Brand. For. Fl. 157.—*Doung-sop.*—A large erect shrub, unarmed, all parts quite glabrous; leaves abruptly bipinnate, ½-1 ft. long, with 5-7 pairs of pinnæ, the rachises unarmed and more or less pruinous; leaflets in 6-12 pairs, oblong to elliptically oblong, somewhat unequal, very shortly

petioluled, ½-¾ in. long, retuse, chartaceous or membranous, glabrous, pale-coloured beneath; flowers large, showy, from yellow to orange-red or variegated in the same colours, on slender 2-3 in. long pedicels, forming terminal and axillary pruinous racemes; calyx smooth; petals glabrous, cuneate at base; filaments very slender, 1-1½ in. long, quite glabrous; pods linear-oblong, acute at the base, 2-3 in. long, acuminate, the valves rather convex-flat, smooth, black; seeds 3-8, oblong, a little compressed, brown.

Hab.—Generally cultivated in villages all over Burma.—Fl. Fr. ∞.

PELTOPHORUM, Vog.

Sepals 5, united at base in a cup, much imbricate, nearly equal, or the lowermost rather larger. Petals 5, spreading, the 2 lower outer ones rather larger. Stamens 10, free; anthers uniform. Ovary sessile, with 2 or more ovules; style filiform with a broad peltate stigma. Pod oblong-lanceolate, thin and flat, indehiscent, both margins wing-like expanded and marked with a longitudinal intra-marginal nerve. Seeds 1 or 2, rarely more, without albumen.—Unarmed trees, with bipinnate leaves, the leaflets small and numerous. Flowers racemose, in terminal panicles.

1. **P. ferrugineum,** Bth.—An evergreen tree (50—60+20—30+4—6), all softer parts rusty tomentose; leaves bipinnate, with 8-10 pairs of pinnæ, ½-1 ft. long, while young rusty pubescent; leaflets in 10-20 pairs, opposite, oblong to almost falcate-oblong, blunt or almost retuse, often somewhat unequal, almost sessile, ½-⅔ in. long, entire, firmly chartaceous, glabrous above, minutely puberulous beneath; flowers rather small, yellow, on 2-3 lin. long strong rusty-velvety pedicels, racemose and forming a rusty tomentose or velvety panicle at the end of the branchlets; calyx rusty-velvety, the sepals about 2½-3 lin. long; petals about 4-5 lin. long, obovate, waved, villous at the base; pods 2-3 in. long, oblong-lanceolate, almost sessile, shortly acuminate, thick coriaceous, minutely muricated, especially towards the coriaceous borders, or smooth, 1-4-seeded.

Hab.—Not unfrequent in the coast forests of the Andamans.—Fl. May—l.

Remarks.—Wood blackish, the sap-wood whitish, coarse-fibrous, light.

MEZONEURUM, Desf.

Sepals 5, at the base shortly united, much imbricate, the lowermost shorter and concave. Petals 5, spreading, rather unequal, the upper innermost one smallest, the 2 outer lower ones largest. Stamens 10, free; anthers uniform. Ovary with 2 or more ovules; style subulate, with a very small terminal stigma. Pod quite flat,

indehiscent or tardily opening in 2 valves, the upper suture bordered with a wing. Albumen none.—Woody, prickly-armed climbers, with abruptly bipinnate leaves, the leaflets opposite or alternate. Flowers showy, in racemes often collected in a panicle.

Leaflets ⅛ in. long, blunt or retuse, in 8-10 pairs . . . *M. glabrum.*
Leaflets in 1½-2 in. long, bluntish acuminate, in 3-4 pairs . . *M. cucullatum.*

1. **M. glabrum,** Desf.—A large scandent shrub armed with recurved prickles, all parts glabrous, or the shoots more or less puberulous or pubescent; leaves abruptly bipinnate, 1-1½ ft. long, with 4-10 pairs of pinnæ, the secondary rachises puberulous, the main rachis armed with recurved prickles; leaflets oblong to elliptically obovate, alternate or opposite or nearly so, in 8-10 pairs, very shortly petioluled, blunt or rather retuse, about ½ in. long, membranous, glabrous, glaucescent beneath; flowers rather large, yellow, on ½ in. long puberulous pedicels, forming a puberulous raceme in the axils of the leaves and collected in a panicle at the end of the branches; filaments somewhat pubescent; pods about 4 in. long, chestnut-brown or brown, glossy, chartaceous, smooth, the wing about ½ in. broad or somewhat narrower.

Hab.—Frequent in the lower and upper mixed forests, and especially around villages and along choungs of Pegu; a more pubescent variety in the dry forests of Prome.—Fr. C.S.—l.—SS.=SiS., Ca.S., Dil., All.

2. **M. cucullatum,** W.A.; Brand. For. Fl. 155.—*Kyoung-chet.*—A large prickly scandent shrub, all parts quite glabrous; stems terete, about as thick as a man's arm or thicker, brownish grey, covered with small corky pustules and woody compressed oval warts terminated by a straight, short, but sharp prickle; leaves abruptly bipinnate, 1-1½ ft. long, with 2-4 pairs of pinnæ, the rachises armed with recurved prickles; leaflets ovate to elliptically ovate, in 3-4 pairs, on a line long petiolule, bluntish acuminate, 1½-2 in. long, entire or waved, thin coriaceous, glabrous and glossy; flowers middling-sized, yellow, on 3-6 lin. long pedicels, forming simple or branched glabrous racemes often arranged in a terminal panicle; filaments glabrous, bluish; pods 2-4 in. long, very flat, brown and rather glossy, the wing about ⅓ in. broad.

Hab.—Frequent all over Burma from Ava to Pegu and Martaban, in the mixed and dry forests.—Fl. Febr.-March; Fr. Nov.—l.—SS.=∞.

ACROCARPUS, Wight.

Calyx-tube almost bell-shaped, 5-lobed, the lobes short, lanceolate, slightly imbricate in bud. Petals 5, narrow, equal or nearly so, in bud imbricate and unequal with the standard larger and inside. Stamens 5, free; filaments thick and elongate; anthers versatile. Ovary stalked, free on the bottom of the calyx, many-

ovuled; style short, inflexed, the stigma terminal, small. Pod very flat, linear, stalked, narrowly winged along the ventral suture, 2-valved, slightly torulose, many-seeded.—Unarmed trees, with bipinnate leaves. Flowers rather large, in robust racemes at the end of the branches.

1. **A. fraxinifolius,** Wight; Bedd. Sylv. Madr. t. 44.—*Mayanheng.*—A tree (80—100+60—70+6—8), shedding leaves in C.S., the very young shoots appressed pubescent; bark about 2 lin. thick, greyish, annular, sprinkled with rusty coloured tubercles; cut dry, whitish; leaves unpaired-bipinnate, 1½-3 ft. long, pinnæ in 2-4 pairs, with an odd one, opposite, the rachises while very young pubescent, quite glabrescent; leaflets in 8-6 pairs, with or without an odd one, ovate to ovate-oblong, very shortly (1 lin.) petioluled, opposite, acuminate, 1½-2½ in. long, chartaceous, while young shortly pubescent beneath, soon quite glabrous; flowers middling-sized, green, on puberulous about 2 lin. long pedicels, arranged in robust more or less tawny or rusty velvety racemes arising solitary or by 2-3 at the end of the leafless branchlets; calyx shortly pubescent, green, the lobes about 2 lin. long, blunt; petals linear-cuneate, about 3-4 lin. long, green; filaments glabrous, thick, from a green base yellow and orange; pods elongate linear-oblong, very flat and slightly torulose, black and varnished, tapering in a slender ½ an in. long or longer stalk, acute, 4-4½ in. long, 17-18-seeded, the wing nearly 1½ lin. broad; seeds small, somewhat compressed, pale-brown.

Hab.—Common in the tropical forests of the Pegu Yomah.—Fl. Jan.-Feb.; Fr. Apr.-May.—s: l.

Remarks.—Wood white, soft.

PTEROLOBIUM, R. Br.

Sepals 5, at the base united in a cup, imbricate, the lowest longer and concave. Petals 5, spreading, the 2 lower ones rather larger. Stamens 10, free; anthers uniform. Ovary sessile, with a solitary ovule; style filiform with a truncate stigma. Pod samaroid, indehiscent, ending in a large wing. Seed basal, without albumen.—Scandent prickly shrubs, with abruptly pinnate leaves. Flowers in simple or panicled racemes.

1. **P. macropterum,** Kz.—*Kyoung-gyet-nway.*—A large scandent shrub, armed with short prickles, the young shoots slightly puberulous; leaves abruptly bipinnate, ½-¾ ft. long, with 7-8 or more pairs of pinnæ, the rachises prickly and shortly puberulous; leaflets in 7-9 or more pairs, almost sessile, unequal, oblong or elliptically oblong, ⅓-½ in. long, rounded or retuse, membranous, glabrous, pale-coloured beneath; flowers white, small, shortly pedicelled, forming an axillary (? glabrous) raceme; pods samaroid, the seed-

bearing base more than ½ an inch long, the wing 1½ in. long by nearly an inch broad, semi-oblong, rounded at the apex, the inner suture straight.

HAB.—Frequent in the mixed forests, especially along choungs, from Pegu and Martaban down to Tenasserim.—Fr. Jan.—l.

AMHERSTIA, Wall.

The disk-bearing calyx-tube elongate; segments 4, petaloid, somewhat unequal, imbricate. Petals 5, the upper innermost one very broadly obcordate, the 2 lowermost ones minute or rudimentary. Stamens 10, alternately shorter, 9 of them connate at base. Ovary stalked, many-ovuled; style filiform with a terminal stigma. Pod elongate, flat compressed, 2-valved, the upper suture thickened-dilated. Seeds very compressed, without albumen.—Unarmed trees, with abruptly pinnate leaves and narrow, leafy, deciduous stipules. Flowers showy, in drooping terminal racemes. Bracts very deciduous; bractlets ample, highly coloured, persistent.

1. **A. nobilis,** Wall.—*Thaw-ka* or *so-ka.*—An evergreen tree, 30—40 ft. high, the young shoots shortly puberulous; leaves 1-1½ ft. long, abruptly pinnate, while very young minutely puberulous beneath, soon quite glabrous; leaflets in 6-8 pairs, on a thick 1-3 lin. long petiolule, oblong to ovate-oblong, rounded at the base, long and slenderly acuminate, 3-5 in. long, entire, chartaceous, glabrous, somewhat glaucescent beneath; flowers large and showy, crimson, with the 3 lower petals yellow towards the apex, on 3-4 in. long minutely puberous pedicels furnished with a pair of 1½ in. long broadly lanceolate, acuminate, crimson, minutely puberulous bractlets, forming long almost glabrous drooping racemes at the end of the branchlets; sepals glabrous, linear-oblong, rather blunt; petals glabrous, waved, about 3 in. long; ovary tawny-pubescent; pods oblong, flat, glabrous, on a long stalk, about 7 in. long.

HAB.—Tenasserim.—Fl. Jan.-Apr.—s.

AFZELIA, Sm.

Calyx-tube narrowly funnel-shaped or cylindrical, the limb 4-parted, segments almost equal or the inner pair slightly longer, imbricate. Standard longer than the calyx, clawed, the lateral and anterior petals minute, scale-like or none. Perfect stamens 7, the others reduced to staminodes or suppressed; filaments elongate, at the base very shortly united; anthers versatile. Ovary shortly stalked, with 8 to 10 or more ovules. Pod more or less oblong, 2-valved. Seeds separated by transverse spongy septa, with a cup-shaped arillus at base.—Unarmed trees, with abruptly pinnate leaves.

Flowers in terminal racemes often collected into panicles. Bractlets deciduous.

Inflorescence and calyx puberulous; pods ½-1 ft. long, woody; leaves usually bluntish . . . . . *A. bijuga.*
Inflorescence and calyx smooth; pods 3-4 in. long, thin coriaceous; leaves notched . . . . . *A. retusa.*

1. **A. bijuga,** A. Gray.—An evergreen tree (40—60 + 15—20 + 3—5), the very young shoots minutely puberulous; leaves abruptly pinnate, ⅓ to ½ ft. long, the rachis while young minutely puberulous; leaflets in 2 or 3 rarely 1 pair only, opposite or somewhat alternate, on 1-2 lin. long puberulous petiolules, oval to ovate-oblong, bluntish to bluntish acuminate, rarely retuse, 1½-2½ in. long, entire, chartaceous, glabrous; flowers rather small, white, on puberulous ⅓-½ in. long bractless pedicels, forming puberulous racemes usually by 2 or 3 or more collected in a terminal panicle; calyx velvety, the tube 2-3 lin. long, the lobes obovate-oblong, about 4 lin. long; petals glabrous, the lowermost one ½ an in. long, orbicular, undulate, clawed; pods woody, up to ½-1 ft. long by 2 in. broad, oblong, curved, glabrous, apiculate, sessile; seeds ovoid-oblong, compressed, about an inch long.

Hab.—Not unfrequent in the coast and beach jungles of the Andaman Islands.—Fl. May-June; Fr. Apr.—l.

Remarks.—Used in the Andamans for beams and girders of bridges and for posts. Wears well.

2. **A. retusa,** Kz.—An evergreen tree, 15-20 ft. high, all parts quite glabrous; leaves abruptly pinnate, the rachis very short, glabrous; leaflets in a single or 2 pairs, more or less oval, somewhat oblique, very shortly petioluled, 1½ to 2 in. long, entire, chartaceous, notched, glabrous; flowers rather small, white, on about 4 lin. long glabrous pedicels, forming short glabrous simple racemes at the end of the branchlets; bractlets under the calyx 2, small, concave-cymbiform, persistent; calyx smooth, the tube about 4 lin. long, the lobes obovate, as long as the tube; pods oblong, 3-4 in. long by 1-1¼ broad, thin coriaceous, glabrous, somewhat curved along the thickened sutures.

Hab.—Not unfrequent along the coast of the Andamans, in tidal and beach forests.—Fl. May.—l.—SS.=Sal. (?)

SINDORA, Miq.

Calyx-tube disk-bearing, very short or none, the limb 4-parted, the lobes valvate or nearly so. Petal 1 only, sessile. Stamens declinate, shortly and obliquely monadelphous, the uppermost one without anther, the 2 following perfect, the 7 others short and castrate; anthers longitudinally dehiscing. Ovary shortly stalked,

free, few-ovuled; style filiform, with a minute terminal stigma. Pod 2-valved, broad, rigidly coriaceous, usually echinate, often 1-2-seeded. Seeds large, with a large basilar arillus-like strophiole.—Trees, with paired-pinnate leaves. Flowers racemose, one-sided, in terminal panicles. Stipules large, like the bracts and bractlets caducous.

1. **S. Siamensis,** Miq.—An evergreen tree, the young parts tawny puberulous; stipules rather large, falcate-lunate, deciduous; leaves abruptly pinnate, shortly petioled, the rachis terete, glabrescent; leaflets usually in 3 pairs, obovate, very shortly petioluled, obtuse or acute at the base, more or less notched, coriaceous, 1½-2½ in. long, densely and elegantly net-veined, puberulous, the margins somewhat thickened and reflexed; flowers shortly pedicelled, bracted, racemose, forming terminal tawny puberulous panicles; sepals 2½ lin. long, densely tawny velvety, muricate at the apex; pods broadly oval, 3-4 in. long, flat, thick coriaceous, distantly but strongly echinate, glabrous; seeds compressed orbicular, about ⅔ in. across, the arillus-like strophiole half the size of the seed, in a dried state horny.

HAB.—Adjoining provinces of Siam.—Fl. Fr. H.S.

PAHUDIA, Miq.

Calyx-tube disk-bearing, more or less elongate, the limb 4-parted, the lobes decussately imbricate. Petal one only developed, shortly clawed, the lower ones very rudimentary or altogether wanting. Stamens 7, declinate, united high up into a slit sheath, the filaments unequal and free at the summit, often with 2 small staminodes situated at the base of the staminal tube; anthers longitudinally dehiscing. Ovary stalked, few-ovuled; style filiform, with a small, terminal stigma. Pod as in *Sindora,* 2-valved, but very thick and woody, smooth. Seeds with a large basal arillus-like strophiole.—Trees, with paired-pinnate leaves. Flowers racemose, in sessile or peduncled terminal panicles. Stipules, bracts, and bractlets very caducous.

1. **P. xylocarpa,** Kz.—A tree, the branchlets pruinose, and while young somewhat puberulous; leaves paired-pinnate, shortly petioled, the rachis very slender, glabrous; leaflets in 2 (in the floral ones only in single) pairs, on a thick about 1½-2 lin. long petiolule, more or less oval, rounded at the base, more or less notched, thin chartaceous, 3-3½ in. long, glabrous, glaucescent beneath, the net-veination thin and lax; flowers almost one-sided, racemose, on short thick pedicels, forming grey-puberulous terminal panicles; sepals grey-velvety, about 2½ lin. long, concave-obovate; pods on a woody very thick peduncle, rhomboid-oblong, 2-valved, very thick-woody and somewhat turgid, 4-5 in. long, glabrous, 2-

seeded; seeds compressed, orbicular, enclosed in the medullary endocarp, $1\frac{1}{4}$ in. across, supported by the horny, large, arillus-like funicle.

HAB.—Adjoining provinces of Siam.—Fr. H.S.; Fr. begin. of R.S.

TAMARINDUS, L.

Sepals 4, united at the base into a turbinate tube, the segments much imbricate. Petals 3, the lateral ones ovate, the upper inner one narrower, concave. Stamens incurved, united up to the middle in a sheath, 3 or rarely 2 only perfect, the 4 or 5 others reduced to short teeth at the summit of the sheath. Ovary stalked, with several ovules; style inflexed, rather thick, with a truncate stigma. Pod thick, the epicarp crustaceous and fragile, the mesocarp pulpy, the endocarp thick and fleshy, forming complete partitions between the seeds. Albumen none.—Trees, with abruptly pinnate leaves. Flowers in terminal racemes.

1. **T. Indica,** L.; Bedd. Sylv. Madr. t. 184; Brand. For. Fl. 163.—*Magyee* or *majee-pen*.—An evergreen tree, rarely leaf-shedding (50—60 + 8—20 + 6—12), the young shoots puberulous; leaves abruptly pinnate, 2-3 in. long, glabrous; leaflets in 8-12 pairs, opposite, oblong-linear, somewhat oblique, sessile or nearly so, $\frac{1}{2}$-1 in. long, rounded or retuse at the apex, entire, chartaceous, glabrous, somewhat glaucescent beneath; flowers rather small, with rose-coloured petals, on 3-4 lin. long pedicels, forming short terminal bractless racemes; sepals 3-4 lin. long, glabrous; petals lanceolate, somewhat longer than the sepals, acuminate, somewhat orange, streaked with scarlet, undulate; pods 3-6 in. long, thick, somewhat torose, elongate-oblong, the epicarp fragile, rough, brownish grey, the pulp very acid and edible, red while unripe, then brownish olive.

HAB.—Generally cultivated all over Burma, but apparently nowhere wild.—Fl. H.S.; Fr. C. S.—SS. = ∞ CaS.

REMARKS.—Sap-wood yellowish white, not heavy, rather fibrous and loose-grained, perishable; the heart-wood of old trees only small, very hard, dark-coloured and resembling ebony, sometimes beautifully dark-reddish veined. Good for oil-mills, mallets, rice-pounders, also for furniture and in house-building, but difficult to work on account of its hardness. Yields a white resin in small quantities.

SARACA, L.

The disk-bearing calyx-tube elongate; segments 4, petaloid and nearly equal, much imbricate. Petals none. Stamens 3-9, free, the filaments elongate; anthers almost uniform. Ovary stalked, many-ovuled; style filiform with a terminal blunt stigma. Pod

oblong or elongate, flat or somewhat turgid, 2-valved. Arillus and albumen none.—Unarmed trees, with abruptly pinnate leaves. Stipules small, deciduous. Flowers racemose, forming short lateral and terminal panicles.

1. **S. Indica,** L; Bedd. Sylv. Madr. t. 57 (except the pod); Brand. For. Fl. 166.—*Thaw-ka-hpo.*—An evergreen tree (25—30 + 8—12 + 2—3), all parts glabrous; leaves abruptly pinnate, ¾-1½ ft. long, glabrous; leaflets in 4-5 pairs, on a thick 1-2 lin. long petiolule, oblong to oblong-lanceolate, shortly acuminate to bluntish, 4-6 in. long, thin coriaceous, entire; flowers middling-sized, scarlet, on ½-1 in. long scarlet smooth pedicels 2-bracteoled at middle, forming a glabrous usually nodding more or less crowded cymose panicle at the end of the branchlets and lateral; bracts smaller than the bractlets, triangular-acute; calyx glabrous, scarlet, the tube about ½ an in. long, the lobes elliptical, about 3 lin. long, rounded; pods flat, elongate oblong-lanceolate, woody coriaceous, ½-¾ ft. long, long-stalked, smooth.

Hab.—Tropical forests of Arracan, as, *e. g.*, Boronga island; also Tenasserim.—Fl. Oct.—s.—SS.=SiS.

CYNOMETRA, L.

Sepals at the base very shortly united, the free part separating into 4 imbricate segments, the upper one rather broader. Petals 5, nearly equal. Stamens 10 or more, free; filaments filiform; anthers uniform. Ovary nearly sessile, with 2 ovules; style subulate, with a small terminal stigma. Pod obliquely half-orbicular, fleshy and often edible, turgid, 2-valved. Seed usually solitary.—Unarmed trees or shrubs, with abruptly pinnate leaves, the leaflets in few pairs only. Flowers small, in axillary or lateral clusters or racemes.

Flowers in short umbel-like puberulous racemes; ovary villous . *C. ramiflora.*
Flowers in longer or shorter bracted racemes; pedicels glabrous; ovary glabrous or puberulous . . . . . *C. cauliflora.*

1. **C. ramiflora,** L.; Bedd. Sylv. Madr. t. 315.—*Myeng-ka-pen.*—An evergreen tree (15—25 + 4—10 + 1—2), all parts glabrous or the young shoots puberulous; leaves abruptly pinnate, 2-6 in. long, the rachis strong and glabrous or slender and puberulous; leaflets in 1 or 2 pairs, obliquely obovate-oblong to almost falcate-oblong, sessile or nearly so, 1-3 in. long, entire, very blunt or shortly and bluntish acuminate, coriaceous, glabrous; flowers small, white, on slender 3-4 lin. long puberulous pedicels, forming small umbel-like clusters above the axils of the fallen leaves; bracts very deciduous; calyx about a line long; stamens 10; ovary tawny villous; pods fleshy and strongly wrinkled, irregularly oblong or ovoid, terminating in a fleshy thick acumen, about ½ in. long and nearly as broad, glabrous.

HAB.—Frequent in the tidal and beach jungles along the coasts from Chittagong down to Tenasserim and the Andamans.—Fl. Oct.; Fr. C.S.—l.—SS.=Sal.

2. **C. cauliflora,** L.; Bedd. Sylv. Madr. t. 315.—An evergreen tree (15—20 + 1—2 + 2—3), all parts glabrous; leaves abruptly pinnate, glabrous; leaflets in a single pair or rarely one of them abortive, very shortly petioluled or almost sessile, unequal, dimidiate-oblong to somewhat falcate-lanceolate, somewhat narrowed at the notched apex, 2-3 in. long, entire, thin coriaceous, glabrous; flowers small, white, or a little red-tinged, on rather thick glabrous pedicels about 2 lin. long, forming shorter or longer sessile, bracted, glabrous racemes arising by 3 or more from the trunk and older branches; bracts concave-ovate, more than ½ a line long, glabrous; filaments and ovary glabrous or the latter a little puberulous; pods thick and fleshy, conspicuously wrinkled and turgid, irregularly oblong to almost irregularly globose, apiculate, glabrous, 1-4 in. long, edible.

HAB.—Burma, cultivated only.

II.—SUB-ORD. *Mimoseæ. Flowers regular. Sepals and petals valvate and often united. Stamens* 5 *or* 10, *or very numerous.*

ENTADA, Adans.

Calyx very shortly 5-toothed. Petals 5, valvate, more or less united or free. Stamens 10, free, shortly exserted; anthers gland-tipped. Ovary nearly sessile, with several ovules; style filiform, with a truncate stigma. Pod large and long, flat, coriaceous or woody, the sutures thick and persistent after the separation of the one-seeded articles, the endocarp separating from the epicarp and persistent round the large flat seeds.—Lofty woody climbers, unarmed, with abruptly bipinnate leaves. Flowers small, sessile, in long spikes sometimes collected into a terminal panicle. Bracts very small.

1. **E. scandens,** Bth.; Brand. For. Fl. 167.—*Kong-nyin-nway.*—A very large scandent shrub, all parts glabrous, the stems screw-like twisted and often as thick as a man's thigh, with patelliform protuberances; bark 2 lin. thick, blackish or brownish, squarish fissuring and corky lenticellate; cut red; leaves abruptly bipinnate, glabrous, with 2 or rarely 1 pinnæ only, the terminal one transformed in a double tendril; leaflets in 2-5 pairs, oblong to obovate-lanceolate, very shortly petioluled, narrowed at both ends, retuse, 1-2½ in. long, entire, membranous or thin chartaceous; flowers small, yellowish, sessile, forming elongate slightly pubescent spikes in the axils of the upper leaves or arranged in a terminal panicle; calyx ½ lin. long; petals about a line long; pods 2-4 ft. long by 2-3 in. broad, woody,

with woody thickened borders, jointed, torulose; seeds nearly 1½ in. in diameter.

HAB.—Frequent all over Burma and adjacent provinces and islands, especially in the mixed forests.—Fl. March-Apr.; Fr. C.S.—s: l.—SS. = ∞ *SiS.*, *All.*

REMARKS.—Wood very coarse, fibrous, and porous.

ADENANTHERA, L.

Calyx 5-toothed. Petals 5, valvate, at length free. Stamens 10, free; anthers tipped with a deciduous gland. Ovary sessile, with several ovules; style filiform, with a small terminal stigma. Pod compressed, elongate, often curled up when fully ripe, 2-valved, the endocarp often forming more or less complete partitions between the seeds. Testa of seeds hard, shining scarlet. Albumen scanty. —Unarmed trees, with abruptly bipinnate leaves. Flowers small, pedicelled, in long spike-like racemes often collected in a terminal panicle.

1. **A. pavonina,** L.; Bedd. Sylv. Madr. t. 96.; Brand. For. Fl. 168.—*Yuay-kyee.*—A tree (60—70+30—40+4—6), shedding leaves in C.S., the young shoots appressed silk-hairy; leaves abruptly bipinnate, 1-1½ ft. long, with 5-2 pinnæ, while young appressed pubescent; leaflets in 6-10 pairs, on a very short puberulous petiolule, elliptically oblong, blunt, ½-1 in. long, entire, beneath puberulous and glaucous; flowers small, yellow, on a line long capillary puberulous pedicels, in pubescent elongate racemes forming a terminal simple panicle or rarely solitary in the axils of the leaves; calyx ½ lin. long, puberulous; petals about a line long; pods curved, 4-6 in. long, linear, acuminate at both ends, when fully ripe curling up, torose, 2-valved, thin coriaceous, black and glabrous outside, pale-yellow within; seeds about 4 lin. in diameter, shining scarlet, lenticular-compressed.

HAB.—Frequent all over Burma and adjacent islands, in the tropical forests up to 2,500 ft. elevation.—Fl. Apr.-May; Fr. C.S.—s.—SS.=SiS. *Metam.*

REMARKS.—Wood rather heavy, coarse, fibrous, light-brown or yellowish grey, turning brown at exposure, hard and close-grained, soon attacked by xylophages; the heart-wood dark-brown, solid, hard and durable. Suitable for cabinet-work. Wood yields a red dye. The scarlet seeds are used by jewellers for weights, also for ornaments, &c.

PARKIA, R. Br.

Flowers 5-parted, in heads, the upper ones hermaphrodite, the lower ones male or sterile. Calyx tubular with a shortly 5-lobed bilabiate limb, the two lower segments larger. Petals narrowly linear-spatulate, confluent below with the filaments, valvate

in bud (?). Stamens 10, exserted; anthers blunt. Ovary stalked or sessile, many-ovuled; style slender, with a minute terminal stigma. Pods elongate or oblong, compressed, 2-valved, almost indehiscent or dehiscent, coriaceous. Seeds enveloped in fleshy or dry pulp. Albumen none.—Unarmed trees, with abruptly bipinnate leaves, the leaflets usually very numerous. Flowers small, each furnished with a narrow spatulate bract, sessile, in dense globose or pyriform long-peduncled pendulous heads.

Receptacle irregular; calyx-lobes rotundate; pinnæ 20 or more; leaflets only ½ in. long, quite glabrous . . . . . *P. leiophylla.*
Receptacle globose; calyx-lobes obovate-cuneate; pinnæ about 8; leaflets an inch long, pubescent beneath . . . . . *P. insignis.*

1. **P. leiophylla,** Kz.—A tree (80—120 + 50—80 + 6—9), leafless in H.S., the young shoots pubescent; leaves abruptly bipinnate, 1-2 ft. long, with about 20 or more almost opposite pinnæ, the rachises all tawny and shortly pubescent; leaflets about 30-40, sessile, opposite, linear-oblong and a little falcate, obliquely auricled at the base, ½ in. long by about 2 lin. broad, obliquely acute, thin coriaceous, quite glabrous, 1-nerved with a solitary lateral basal nerve, penninerved; flowers small, yellowish, densely crowded on an irregularly globose receptacle contracted into a nearly an inch long stalk and forming a dense club-shaped head on 1-1½ ft. long glabrous peduncles forming shorter or longer racemes at the end of the branches; calyx nearly 4 lin. long, the tube glabrous, the lobes rotundate and densely tawny tomentose outside; pods 1-1½ ft. long, linear, narrowed into a ½-¾ ft. long stalk, rounded at the apex, glabrous and somewhat varnished, black, torose at the numerous seeds.

Hab.—Frequent in the tropical and moister upper mixed forests along the eastern slopes of the Pegu Yomah.—Fl. H.S. (?); Fr. Feb.-March.—s.: l.—SS. =SiS.

Remarks.—Sap-wood white, soft.

2. **P. insignis,** Kz.—*Myouk-tanyet.*—A tree (80—100 + 40—60 + 6—8), leafless in H.S., the young shoots tawny pubescent; bark dark-brown, ⅓ in. thick, roughish; cut red; leaves abruptly bipinnate, 1-2 feet long, with about eight almost opposite pinnæ, the rachises tawny or rusty tomentose; leaflets in 20 to 25 pairs, almost opposite, a little falcate, oblong, sessile, with an unequal slightly auricled base, rounded at apex, 1 in. long by ⅓ broad, entire, coriaceous, the nerves excepted glabrous above, beneath pubescent, penninerved, with the nerves arcuately anastomizing; flowers small, yellow, sessile, and densely crowded on the club-shaped globose receptacle narrowed into an inch long stalk, forming a club-shaped head on the 1 ft. long peduncles which arise several together at the end of the branches; calyx about 4 lin. long, the tube

glabrous or nearly so, the lobes obovate-cuneate, appressed tawny pubescent.

HAB.—Not unfrequent in the tropical forests of Martaban, east of Tounghoo.—Fl. March-Apr.—s : l.—SS.=Metam.

REMARKS.—Wood yellowish, turning pale-brown, rather heavy, of a somewhat unequal coarse fibre, soon attacked by xylophages. Exudes a red resin.

XYLIA, Bth.

Flowers small, 5-parted, sessile, mostly hermaphrodite. Calyx tubular-bell-shaped, 5-toothed. Petals slightly cohering at the base, valvate. Stamens 10, free, exserted; anthers without glands. Ovary sessile, many-ovuled; style filiform, with a small terminal stigma. Pod sessile, broadly falcate, flat, woody, elastically 2-valved, septate between the transverse compressed seeds.—Unarmed trees, with abruptly bipinnate leaves, the pinnæ in a single pair. Stipules small, linear, deciduous. Flower-heads globular, pedunculed, solitary from the scars of the fallen leaves or spuriously racemose.

1. X. dolabriformis, Bth.; Bedd. Sylv. Madr. t. 186; Brand. For. Fl. 171.—*Pynkadoe.*—A tree (90—100+50—60 + 9—12), remaining stunted in sterile grounds, leafless in H.S., the young shoots yellowish pubescent; bark very thin, greyish, rather smooth, longitudinally striate, peeling off in irregular rounded pieces; leaves abruptly bipinnate, the single pair of pinnæ on a 1-1½ in. long petiole, while very young pubescent, soon glabrescent; leaflets in 4-5 pairs, on a thick a line long petiolule, ovate to ovate-oblong, somewhat oblique, 1½-3 in. long, bluntish acuminate, chartaceous, when full grown glabrous; flowers small, yellowish, sessile, in a small pubescent head borne on 1½-2 in. long shortly pubescent peduncles arising from above the scars of the fallen leaves and often appearing spuriously racemose or clustered; calyx yellowish villous; pods broadly falcate-lanceolate, cuneately tapering at the base, 3-4 in. long, greyish brown, glabrous, striate, rather acute, flat, woody elastically 2-valved, many-seeded.

HAB.—Common in all leaf-shedding forests, but chiefly in the upper mixed forests, all over Burma from Ava and Martaban down to Tenasserim, up to 3,000 ft. elevation.—Fl. March-Apr.; Fr. C.S.—l.—SS.= ∞ *SiS.*

REMARKS.—Wood brown to dark-brown, heavy, fibrous, but close-grained, very hard, strong and durable, but not easy to work. $\square' = 60$-66 pd. "The iron-wood of Pegu." The sap-wood soon attacked by white ants, but the heart-wood said to be as durable as teak. Recommended for spars, crooks of ships, railway sleepers, handles of chisels, gauges. Used for ploughs, house-posts, bridge-posts, boat anchors, in the construction of carts and for other purposes. Exudes a red resin.

ACACIA, Willd.

Sepals 5, 4, or 3, free or united, rarely wanting altogether. Petals as many, free or united. Stamens indefinite, usually very numerous, free or slightly united at the very base. Ovary sessile or stalked, with 2 to many ovules; style filiform with a small terminal stigma. Pod linear or oblong, flat to nearly cylindrical, straight falcate or variously twisted, opening in 2 valves or indehiscent. Seeds more or less flattened, the funicle usually thickened under or round the seed.—Trees or shrubs, often scandent, prickly or unarmed, with abruptly bipinnate leaves reduced to simple phyllodia (dilated petioles). Flowers small, in globular heads or cylindrical spikes, often polygamous.

* *Trees or erect shrubs, armed only with paired diverging stipulary or infra-stipulary spines.*

× Flowers in globular heads.

Pods thick and almost terete, fleshy; flower-heads clustered . . *A. Farnesiana.*

Pods flat, dry; flower-heads arranged in terminal panicles . . *A. leucophlœa.*

× × Flowers in spikes.

○ Leaves with 10-30 pairs of pinnæ; leaflets 1-nerved at base. Pods slenderly stalked.

Spikes white, tomentose; young leaves greyish pubescent; bark white . . . . . *A. suma.*

Spikes yellow, glabrous or pubescent; leaves glabrous or nearly so; bark dark-brown . . . . . *A. catechu.*

○ ○ Leaves with 3-5 pairs of pinnæ; leaflets 3-5-nerved at base, glabrous . . . . . *A ferruginea.*

* * *Climbers. No stipulary prickles, but the branchlets armed along their whole length with recurved sharp prickles. Flower-heads globular.*

× Pods thick, fleshy-coriaceous, glabrous . . . . *A. concinna.*

× × Pods dry, chartaceous or thin coriaceous, flat.

○ Ovary and pods pubescent . . . . . *A. cæsia.*

○ ○ Ovary and pods glabrous.

Leaflets 8-20 pairs, ½ in. long . . . . . *A. Intsia.*

Leaflets in 30-40 pairs, 2-3 lin. long; branchlets puberulous, but not pruinose; flower-heads the size of a large pea . . . *A. pennata.*

As preceding, but the flower-heads doubly larger; branchlets pruinose; leaflets about 6 lin. long, glabrous . . . *A. pruinescens.*

* *Trees or erect shrubs, armed only with paired diverging stipulary or infra-stipulary spines.*

1. **A. Farnesiana**, Willd.; Bedd. Sylv. Madr. t. 51; Brand. For. Fl. 180.—*Nan-lon-kyaing.*—An evergreen tree (20—25+8—10+1—1½), armed with paired, straight, sharp, stipulary spines of 2-3 lin. length, the young shoots slightly pubescent; leaves abruptly bipinnate, 1½-3 in. long, with 3-6 pairs of pinnæ, the rachises slightly and minutely pubescent, usually with a minute gland above the base of the petiole; leaflets in 12-20 pairs, linear-oblong and very slightly curved, blunt or almost acute, sessile, 2-3 lin. long, coriaceous, glabrous or nearly so; flowers small, very

scented, sessile, in globular heads of nearly ½ an in. in diameter, borne on 1-1½ in. long pubescent or almost glabrous naked peduncles arising by 1-4 or more from the axils of the leaves; calyx shortly toothed, almost glabrous; petals twice as long as the calyx, tubular-connate; pods coriaceous, irregularly cylindrical, straight or curved, almost sessile, acuminate, 1-2 in. long, smooth, or in a dried state striolate, indehiscent or nearly so; seeds irregularly oblong, oblique.

Hab.—Frequently cultivated in villages all over Burma, more especially in Prome and Ava, and here often semi-spontaneous.—Fl. Jan.—l.—SS.=∞*CaS.*

Remarks.—Wood very hard and tough, much used in India for ship-knees, tent-pegs, and similar purposes. A delicious perfume is distilled from the flowers. Exudes a considerable quantity of a sort of white gum-arabic.

2. **A. leucophlœa,** Willd.; Bedd. Sylv. Madr. t. 48; Brand. For. Fl. 184, t. 27.—*Ta-noung.*—A leaf-shedding tree (50—60+8—25+4—6), the lower branches fearfully armed with paired, straight, sharp, blackish, stipulary spines of ½-1 in. length, the young shoots pubescent or almost glabrous; leaves abruptly bipinnate, 3-4 in. long, with 4-7 pairs of pinnæ, the rachises pubescent or almost glabrous; leaflets in 12-30 pairs, obliquely linear-oblong, blunt or acute, 3-4 lin. long, rigidly chartaceous, glabrous or slightly pubescent; flowers minute, sessile, yellowish, in globular heads of the size of a pea or pepper-kernel, on 2-3 lin. long pubescent or tomentose slender or robust peduncles bracted at middle, arranged in an ample leafless tomentose or puberulous panicle at the end of the branchlets; calyx about ¼ lin. long, like the corolla slightly pubescent outside; pods narrow-linear to linear, usually curved, while young shortly tomentose, sometimes quite glabrescent, blunt with a mucro, 3-4 in. long, flat, 2-valved; seeds compressed, greyish brown.

Hab.—Not unfrequent in the dry forests of Prome; also Ava.—Fr. March.—l.—SS.=CaS.

3. **A. Suma,** Buch.; Brand. For. Fl. 187 (*A. catechu,* Bedd. Sylv. Madr. t. 49).—An evergreen (?) tree (30—40+12—20+3—4), the shoots and young parts all greyish pubescent, the stem remarkably white and armed with occasional woody tubercles terminated by a prickle, the branches prickly from paired usually straight, sharp, stipulary spines; leaves abruptly bipinnate, 4-10 in. long, with 10-30 pairs of pinnæ, the rachises shortly greyish pubescent; leaflets in 30 to 50 pairs, sessile, linear, acute, not or slightly falcate, 2-3 lin. long, ciliate, and often also hairy along the midrib beneath, chartaceous; flowers small, white, sessile, forming greyish pubescent spikes in the axils of the leaves; calyx about a line long, greyish velvety; corolla only a little longer than the calyx

puberulous; pods linear-oblong, rigidly coriaceous, greyish brown, tapering in a short stalk, acuminate, 2-3 in. long, glabrous.

Hab.—Ava.

4. **A. catechu,** Willd.; Brand. For. Fl. 186 (*A. sundra,* Roxb.; Bedd. Sylv. Madr. t. 50).—*Sha.*—A tree (50—60 + 15—25 + 4—6), shedding leaves in H.S., the branchlets armed with paired, short, but sharp, usually curved or almost straight, blackish, often somewhat dilated stipulary spines, the younger parts more or less pubescent or almost glabrous; bark brown, cracked, peeling off in long flakes which remain hanging, and hence the trunk often appears somewhat scaly; cut red; leaves abruptly bipinnate, 4-6 in. long, with 10-20 pairs of pinnæ, the rachis more or less pubescent or when full grown sometimes quite glabrous; leaflets in 20-40 pairs, sessile, linear, about 2 lin. long, rigidly chartaceous, blunt or acute, ciliate or quite glabrous; flowers small, yellow, sessile, forming more or less elongate, shortly pubescent or glabrous spikes arising solitary or by 2-3 from the axils of the leaves; calyx ½ a line long, toothed, pubescent or glabrous; corolla thrice or nearly twice as long as the calyx, glabrous or nearly so; pods linear-lanceolate, very flat, acuminate at both ends and tapering in a short stalk, 2-3 in. long, black or brown, often glossy; seeds compressed, greyish brown.

Var. 1. **Catechu proper;** young parts all slightly appressed pubescent, soon glabrescent; the stipulary spines usually recurved and blackish; leaves when full grown glabrous or the leaflets ciliate, the rachis slightly pubescent; spikes shorter and thicker, along with the calyx and petals more or less appressed pubescent; corolla about twice as long as the calyx.

Var. 2. **Sundra** (*A. sundra, DC.*); all parts glabrous or the very young shoots slightly pubescent; stipulary spines usually short and curved, blackish; leaves and their rachis when full grown quite glabrous; spikes elongate and slender, along with the calyx quite glabrous; corolla glabrous, about ⅔ longer than the calyx.

Hab.—Var. 1 common all over Ava and Prome, extending into the Irrawaddi zone of Pegu, especially in the dry forests, rather rare in the lower mixed and savannah forests: var. 2 apparently in Ava.—Fl. begin. of R.S.; Fr. C.S.—1.—SS.=*CaS.* All.

Remarks.—Sap-wood yellowish white, varying in bulk according to age from 3 and more inches to 1 inch thickness, rather heavy, fibrous, but close-grained; the heart-wood similar, but dark-brown, very strong and durable; takes a fine polish. □′=56-70. Employed for posts and uprights of houses, for spear and sword handles, bows, &c. There are several varieties according to Dr. Brandis, differing in shade, specific weight, and yield of kutch. The wood is considered more durable than teak, and is not attacked by xylophages. Recommended for railway sleepers. Kutch or catechu (*Terra japonica* of commerce) is extracted from the wood in large quantities. Exudes a blackish resin.

5. **A. ferruginea,** DC.; Brand. For. Fl. 185.—An evergreen (?) tree 20-30 ft. high, all parts glabrous, unarmed or more usually the branchlets armed with short glossy black stipulary prickles; bark dark-brown, deeply cracked; leaves unpaired-pinnate, on a slender 2-3 in. long petiole bearing a gland at the middle and between the insertion of the pinnæ, with 3 to 6 pairs of pinnæ, glabrous; leaflets in 10-20 pairs, unequally oblong, almost sessile with an obliquely rounded base, blunt or obliquely acute, ½-⅓ in. long by 1⅔-½ lin. broad, 3-5-nerved at the base, chartaceous, glaucous green; flowers small, yellow, sessile, forming peduncled, glabrous, more or less elongate spikes in the axils of the leaves; calyx glabrous, ½ a line long; corolla twice as long, glabrous; pods linear-oblong, sessile or nearly so, with a thick tapering base, 4-6 in. long by 1 broad, flat, bluntish, opaque and laxly veined, brown; seeds flat, brown, glossy.

HAB.—Burma, without locality (taken up on Beddome's authority, who gives the Burmese name "sitnet" for it).

* * *Climbers. No stipulary prickles, but the branchlets along their whole length armed with recurved sharp prickles.*

6. **A. concinna,** DC.; Brand. For. Fl. 188.—*Soo-pwot-nway.*—A large scandent shrub, the stems and branches armed with numerous compressed short, sharp, recurved prickles, the young shoots more or less shortly pubescent; leaves abruptly bipinnate, 4-5 in. long, with 4-6 pairs of pinnæ, the rachis puberulous or almost glabrous, armed on the back with recurved prickles; leaflets in 10-20 pairs, sessile, dimidiate-linear-oblong, truncate at the broader base, blunt or bluntish, up to ½ in. long, membranous, glabrous or nearly so; flowers small, sessile, yellowish, in small heads of about ⅓ in. in diameter, borne on 1-1½ in. long sparingly pubescent or densely puberulous peduncles arising solitary or by 2 or 3 from the axils of the leaves or from above the scars of the fallen ones; calyx more or less pubescent or almost glabrous; pods thick-fleshy, when dry wrinkled, 2½-4 in. long by ¾ broad, linear-oblong and occasionally constricted between the seeds, tapering at the base, blunt with a thick point, slightly torose, glabrous, slowly dehiscing; seeds rather compressed, black.

HAB.—Frequent in the tropical and moister upper mixed forests all over Burma down to the Andamans.—Fl. March-Apr.—Fr. C.S.—s: l.—SS.=petrophilous.

7. **A. Intsia,** Willd.—A large scandent shrub, the branches armed with numerous recurved, black, small but sharp prickles, the branchlets more or less shortly rusty or tawny pubescent or tomentose; leaves abruptly bipinnate, ½-⅔ ft. long, with 4-8 pinnæ, the

rachises more or less pubescent or almost tomentose and recurved-prickly; leaflets in 8-20 pairs, sessile, unequal, almost falcate-oblong, with a more or less rounded unequal base, more or less acute, about ½ in. long, chartaceous, glabrous, with a strong lateral nerve arising from the base; flowers small, yellowish, sessile, forming small globular heads of about ⅓ in. in diameter, borne on straight, tawny tomentose, ½-⅔ in. long, naked peduncles solitary or by 2-4 clustered and forming a rather ample shortly tomentose panicle at the end of the branchlets; calyx about ½ lin. long, slightly pubescent, the corolla somewhat longer; pods linear-lanceolate or elongate-oblong, 3-5 in. long, very flat, with the borders somewhat thickened, often on the same plant gradually tapering or abruptly contracted in a short stalk, acuminate or blunt, brown, smooth; seeds compressed, blackish brown, glossy.

HAB.—Chittagong hills.

8. **A. pennata**, Willd.; Brand. For. Fl. 189.—*Soo-yit.*—A large scandent shrub, the branches and branchlets armed with numerous small but sharp, recurved, glossy, blackish prickles, the young branchlets slightly pubescent or almost glabrous; leaves abruptly bipinnate, ½-1 ft. long, with 8-20 pairs of pinnæ; the rachises glabrous or slightly pubescent, unarmed, or occasionally prickly; leaflets in 30-40 pairs, sessile, dimidiate-linear, 2-3 lin. long, blunt or nearly so, rigidly chartaceous, glabrous; flowers small, yellow, sessile, in small globular heads about the size of a pea, borne on ½-⅔ in. long naked puberulous peduncles clustered and forming a more or less ample puberulous panicle at the end of the branches and in the axils of the upper leaves; calyx hardly ½ lin. long, glabrous; corolla somewhat longer; pod oblong-linear, acuminate or acute at both ends, shortly stalked, very flat, with the borders somewhat thickened, 4-5 in. long, glabrous, brown or blackish; seeds compressed.

HAB.—Common in all leaf-shedding forests all over Burma and adjacent islands.—Fl. R.S.; Fr.C. S.—l.—SS.=∞.

REMARKS.—Wood porous, brown, rather heavy.

9. **A. pruinescens**, Kz.—A large woody climber, armed with recurved thorns, the stems as thick as an arm, the young branchlets pruinose; leaves up to 10 in. long, the petiole rather short with a large gland far above the base; pinnæ numerous, the rachis slightly pubescent and sparingly recurved prickly; leaflets in numerous pairs, sessile, dimidiate-linear, up to 6 lin. long, blunt, glabrous or ciliate; flowers small, yellow, sessile, in globose heads the size of a cherry, borne on tawny pubescent about an inch long peduncles arranged usually in long, axillary, recurved prickly racemes which are pruinose and usually pubescent while young; ovary

glabrous; pods linear-oblong, acute at both ends, flat, with thickened sutures, pale-brown, glabrous, 4-6 in. long.

HAB.—Not unfrequent in the tropical forests of the Pegu Yomah; also Ava hills.—Fl. Fr. C.S.—SS.=SiS., etc.

10. **A. cæsia**, WA.; Brand. For. Fl. 189.—A large scandent shrub, the branches and branchlets terete, and more or less shortly and softly tawny or rusty pubescent, armed with numerous small but sharp recurved pubescent prickles; leaves abruptly bipinnate, $\frac{1}{2}$-1 ft. long, with 7-15 pairs of pinnæ, the rachises softly pubescent or almost tomentose and often armed with recurved prickles; leaflets in 15-40 pairs, from rhomboid to almost falcate-oblong, unequal, sessile, bristly acute or bluntish, with or without a minute mucro, 3-6 lin. long, rigidly chartaceous to almost membranous, while young on both sides (especially beneath) appressed pubescent, more or less glabrescent above, rarely also beneath; flowers small, white, sessile, in small globular heads of the size of a large pea, borne on a tawny tomentose $\frac{1}{2}$-$\frac{3}{4}$ in. long peduncle, several together, clustered and forming an ample shortly tawny tomentose panicle at the end of the branchlets; calyx hardly $\frac{1}{2}$ lin. long, slightly pubescent; corolla somewhat longer than the calyx; pods oblong, often occasionally sinuate-constricted, more or less abruptly contracted in a short stalk, usually blunt with a point, very flat, with the borders somewhat thickened, shortly and minutely pubescent and hardly glabrescent; seeds compressed, blackish.

HAB.—Not unfrequent in the tropical forests along the eastern slopes of the Pegu Yomah and Martaban.—Fr. C.S.—s: l.—S S. = SiS., Metam.

ALBIZZIA, Durazz.

Calyx bell-shaped or tubular, 5- or rarely 4-toothed. Corolla 5- or rarely 4-lobed, with a cylindrical tube. Stamens indefinite and usually very numerous and long, the filaments united in a longer or shorter basal tube enclosing the ovary. Pod linear or oblong, straight and flat, or rather thick and curved, either opening into 2 valves, or only along one suture or quite indehiscent, without pulp inside. Seeds orbicular to ovate, more or less compressed, the funicle long and filiform.—Trees or shrubs, unarmed, with abruptly bipinnate leaves. Flowers small, in globular or oblong heads or umbels or rarely in cylindrical spikes, often collected into terminal panicles.

× Pinnæ numerous (10-18); leaflets linear, 1-6 lin. long, in very numerous pairs.
  ○ Leaflets bluntish, the nerve central or nearly so; flower heads small, in terminal panicles . . *A. myriophylla.*
  ○ ○ Leaflets acute or nearly so, the nerve marginal or nearly so.
Stipules very large, obliquely ovate, acuminate; all parts more or less shortly pubescent . . . . . *A. stipulata.*
Stipules none or obsolete; all adult parts glabrous or nearly so . *A. elegans.*

× × Pinnæ in 2-6 pairs; leaflets ovate to oblong, ½-1½ in. long, in several pairs, blunt.
○ Leaflets sessile.
Calyx minute; corolla 1½ lin. long . . . . . *A. odoratissima.*
Calyx 1½ lin. long; corolla 4 lin. long . . . . . *A. Lebbek.*
○ ○ Leaflets shortly petioluled; pinnæ in 4-3 pairs.
Leaflets ½-1 in. long; pods tapering at the base, linear, smooth, brown . . . . . *A. procera.*
Leaflets 2½-4 in. long; pods stalked, oblong, veined, black . . *A. Teysmanni.*
× × × Pinnæ in a single pair; leaflets large, acuminate, in a few pairs only, glabrous; pods broad and flat . . . . . *A. lucida.*

1. **A. myriophylla,** Bth.—A small evergreen tree, the young shoots tawny and shortly pubescent; leaves abruptly bipinnate, 3-10 in. long, with 10 to 18 pinnæ, the rachises rusty puberulous; leaflets in 20-40 pairs, sessile, linear, slightly falcate, bluntish, ciliolate, 2-3 lin. long, rigidly chartaceous, glabrous; flowers small, white, sessile or nearly so, in small heads, on ½-⅔ in. long tawny puberulous peduncles clustered and forming larger or smaller panicles in the axils of the upper leaves and at the end of the branchlets; calyx tawny pubescent, minute; corolla about a line long, funnel-shaped, pubescent outside; pods linear-lanceolate, acuminate at the base, occasionally sinuate between the seeds, 2-3 in. long, very flat and thin, glossy brown, smooth.

Hab.—Tenasserim.—Fl. Apr.

2. **A. stipulata,** Boiv.; Bedd. Sylv. Madras t. 55; Brand. For. Fl. 178.—*Bo-me-za.*—An evergreen tree (100—120 + 60—80 + 8—12½), often shedding leaves in H.S., the young parts all shortly pubescent; stipules unusually large, 1-1½ in. long, obliquely cordate, acuminate, velvety pubescent, deciduous; leaves abruptly bipinnate, ½-1½ ft. long, with 7 to 20, rarely fewer pinnæ, the rachises all shortly tawny pubescent; leaflets in 20 to nearly 50 pairs, sessile, falcate and unequal, oblong-linear, acute, 3-4 lin. long, membranous, slightly and minutely pubescent, ciliate, glaucous or almost whitish beneath, the midrib almost marginal; flowers small, white, almost sessile, in globular heads, on ½-1 in. long shortly pubescent peduncles clustered or racemose and forming terminal, smaller, or larger shortly pubescent panicles at the end of the branchlets; calyx puberulous, about a line long; corolla pubescent, funnel-shaped, nearly 3 lin. long; pods linear-oblong, tapering at the base, more or less blunt, very flat with the sutures slightly thickened, 2½-3½ in. long, pale-coloured or pale-brown, smooth and rather glossy.

Hab.—Frequent in the tropical and moister upper mixed forests, ascending into the drier hill forests, up to 4,000 ft. elevation, from Ava and Chittagong down to Tenasserim.—Fl. Apr.-May; Fr. C.S.—s: 1.—SS.=Metam.—*SiS.*, etc.

Remarks.—Sap-wood broad, white, light, coarse-grained and fibrous; heart-wood dark-brown and heavy, takes fine polish. Good for cabinet-work, furniture, and similar purposes.

3. **A. elegans,** Kz.—An evergreen tree (80—100 + 50—70 + 7—8), the young shoots greyish or tawny puberulous; stipules minute, deciduous; leaves abruptly bipinnate, 1-1½ ft. long, with 7-14 pinnæ, the rachises puberulous and glabrescent; leaflets in 20-25 pairs, somewhat falcate, linear-oblong, sessile, somewhat acute, thin chartaceous, when full grown glabrous, the midrib tolerably median; flowers and fruits unknown.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah, as along the feeders of the Swa-choung, etc.—s.—SS.=SiS.

4. **A. odoratissima,** Bth.; Bedd. Sylv. Madr. t. 54; Brand. For. Fl. 175.—*Thit-ma-kyee.*—A tree (80—100 + 40—60 + 5—8), leafless in H.S., the young shoots almost glabrous or pubescent; bark thick, blackish grey, rough, peeling off in small, irregular, coarse flakes; cut reddish brown; leaves abruptly bipinnate, up to a foot long, with 3 to 8 pinnæ, the rachises more or less glabrous or shortly and softly pubescent; leaflets in 8-25 pairs, sessile, obliquely oblong and very unequal, sometimes falcate, blunt or bluntish, rarely acute, ⅓-¾ in. long, entire, rigidly chartaceous, while young often appressed pubescent, when full grown glabrous and more or less glaucescent beneath; flowers small, yellowish, sessile, in small heads, borne on 1-1½ in. long shortly pubescent peduncles clustered and arranged into more or less ample terminal shortly and softly pubescent panicles; calyx minute, pubescent; corolla funnel-shaped, 1½ lin. long, appressed-pubescent outside; pods linear-oblong, 3-4 in. long by about 1 in. broad, very flat with the sutures slightly thickened, blunt with a stylose mucro, contracted in a very short stalk, blackish or brownish black, smooth and glossy.

Hab.—Frequent in the mixed and dry forests all over Prome, Pegu, and Martaban down to Tenasserim.—Fl. H.S.; Fr. C.S.—s×l.—SS.=∞*SiS.*

Remarks.—Heart-wood dark-coloured, turning almost black with age, strong and heavy, rather loose-grained, takes good polish; sap-wood white, perishable.

5. **A. Lebbek,** Bth.; Bedd. Sylv. Madr. t. 53; Brand. For. Fl. 176.—*Kokko.*—A tree (60—70 + 30—40 + 6—7), leafless in H.S., the young shoots puberulous or almost glabrous; bark whitish; leaves abruptly bipinnate, with 4-2 (rarely 1) pairs of pinnæ, the rachis glabrous or rarely puberulous; leaflets in 5-9 pairs, on a very short (less than ½ a lin. long) petiolule, obliquely oval-oblong to oblong and ovate-oblong, unequal, 1-1½ in. long, retuse or blunt, entire, almost chartaceous, glabrous or rarely sparingly pubescent beneath, somewhat glaucescent beneath; flowers rather small, white, on a line long or somewhat longer minutely puberulous pedicels, forming globular umbels on 1-2½ in. long glabrous or puberulous peduncles arising solitary from the axils of the upper leaves or sometimes arranged in spurious short racemes at the end of the leafless branchlets; calyx tubular, about 1½ lin. long, glab-

rous or puberulous; corolla glabrous, about 4 lin. long; pods ⅓-1 ft. long, linear-oblong, bluntish at both ends or rarely acuminate, very compressed and flat, with the sutures slightly thickened, 1-1½ in. broad, smooth, yellowish, glossy.

Hab.—Frequent in the tropical and moister upper mixed forests from Pegu and Martaban down to Tenasserim, up to 2,000 ft. elevation; also Prome (the pubescent dry-country form) along choungs.—Fl. Apr.-May; Fr. C.S.—s × l.—SS.= ∞*SiS.*

Remarks.—Sap-wood white, coarse-fibrous; heart-wood blackish brown, close-grained, rather heavy, coarsely fibrous, but compact, takes fine polish. Good for furniture and carriage axles, also for building purposes. Yields a pellucid yellowish resin.

6. **A. procera,** Bth.; Bedd. Sylv. Madr. 96; Brand. For. Fl. 175, t. 26.—*Sit-pen.*—A tree (80—90+40—60+7—8), shedding leaves in H.S., all parts glabrous, or the very young shoots slightly pubescent; bark grey; cut red; leaves abruptly bipinnate, 1-1½ ft. long, with 4-3 pinnæ, the rachis glabrous or nearly so; leaflets in 6-8 pairs, on a very short (less than ½ lin. long) puberulous or glabrous petiolule, obliquely oval to oval-oblong, unequal, blunt or somewhat acute, ½ to nearly 1 in. long, entire, rigidly chartaceous, beneath slightly and shortly appressed pubescent and glaucous; flowers small, white, sessile, in small globular heads borne on ½-⅔ in. long glabrous peduncles clustered racemose and forming panicles in the axils of the upper leaves and larger glabrous or slightly puberulous ones at the end of the branchlets; calyx about a line long, glabrous; corolla funnel-shaped, about 2 lin. long, glabrous or nearly so; pods linear, 3-5 in. long by ½-⅔ in. broad, tapering at the base, acute, very flat, with the sutures slightly thickened, brown, smooth.

Hab.—Frequent in the mixed and dry forests all over Pegu and Martaban down to Tenasserim, entering also the tidal savannahs.—Fl. May-June; Fr. C.S.—l.—SS.=Metam. *SiS.* All. Sal. (?).

Remarks.—Sap-wood white or brownish, rather light, coarsely fibrous, but tolerably close-grained; heart-wood brown to blackish brown, rather heavy, close-grained, streaked, hard, strong and durable, takes fine polish. Good for house-building, cabinet-work, etc.

7. **A. Teysmanni,** Kz.—A lofty tree, the leaf-buds puberulous; leaves abruptly bipinnate, about 2 ft. long, glabrous, the rachis and the petiole rather terete, about a foot long, glandless; pinnæ in 4 pairs, up to a foot long; leaflets in 8-9 pairs, very like those of *Cassia fistula,* obliquely or almost rhomboid-ovate, very shortly and slenderly petioluled, obtuse at the unequal base, 2¼-4 in. long, bluntish and usually notched, chartaceous, entire, glabrous; pods oblong, narrowed in a stalk, 5-6 in. long, obliquely acute, almost turgid, black, glabrous, the valves coriaceous, barely

thickened on the margins, veined; seeds 4-6, elliptically orbicular, rather compressed, ½ in. long, brownish.

HAB.—Adjoining Siamese province of Radbooree.—Fr. H.S.

REMARKS.—Yields the best timber of Siam.

7. **A. lucida,** Bth.; Brand. For. Fl. 174.—*Than-that-pen.*—A tree (50—60+25—30+5—6), remaining stunted on impermeable strata, leafless at the begin of H.S., all parts quite glabrous; bark very thin, greyish, covered with little corky pustules; leaves abruptly bipinnate with only a single pair of pinnæ, glabrous; leaflets usually in 2 pairs, oval to elliptically oblong and oblong-lanceolate, on a 1-2 lin. long petiolule, bluntish acuminate, 2-4 in. long, chartaceous; flowers small, yellowish, sessile or nearly so, in small heads, borne on ½-1 in. long glabrous peduncles, clustered and forming terminal glabrous panicles; calyx nearly a line long, minutely toothed, the 2 lin. long corolla outside minutely pubescent; pods 3-6 in. long, linear-oblong, bluntish at both ends, very flat, with the sutures somewhat raised, pale-brown, smooth and somewhat glossy.

HAB.—Common in the dry forests of Ava and Prome; rather rare in the lower mixed forests of Pegu.—Fl. Apr.; Fr. C.S.—s × l. SS.=SiS. Lat. CaS.

REMARKS.—Sap-wood white, coarsely fibrous; heart-wood brown, compact.

PITHECOLOBIUM.

Characters and habit of *Albizzia,* but the pods circinnately or screw-like twisted or curved. Seeds without an arillus.

× Flowers pedicelled, in head-like umbels or racemes.

Pod-lobes 1 in. broad and long; branchlets terete; leaves with a single pair of pinnæ . . . . . *P. lobatum.*

Branchlets sharply cornered; pinnæ 2-4; leaflets in 4-8 pairs . *P. angulatum.*

× × Flowers sessile, in small heads; shrub, pinnæ in a single pair . . . . . *P. glomeriflorum.*

1. **Pithecolobium lobatum,** Bth.—*Tanyeng-pen.*—An evergreen tree (40—50 + 15—25 + 3—4), all parts glabrous; bark 2-3 lin. long, a little rough, minutely fissured, grey; cut dryish, red-brown; leaves abruptly bipinnate, with a single pair of pinnæ on an in. long petiole, glabrous; leaflets in 2-3 pairs, ovate to broad-lanceolate, on a 1-2 lin. long petiolule, long and bluntish acuminate, 2-5 in. long, chartaceous, glabrous and glossy; flowers small, white, sessile or nearly so, forming little heads on short but slender minutely and sparingly puberulous peduncles, clustered or solitary and arranged in smaller or larger axillary and terminal indistinctly pubescent panicles; calyx glabrous, nearly a line long, the teeth ciliate; corolla about 1½ lin. long; pods screw-like twisted, almost down to the ventral suture lobate-sinuate between the seeds, 3-5 in.

long, glabrous, coriaceous, the seed-bearing lobes almost orbicular, about an inch long and broad.

HAB.—Rather frequent in the tropical forests and along choungs in the moister upper mixed forests from the Pegu Yomah and Martaban down to Tenasserim. Also frequently cultivated by the Burmese.—Fl. Apr.-May; Fr. March-Apr.—s.—SS.=Metam. *SiS.*

REMARKS.—Wood coarsely fibrous, but close-grained, rather heavy, the sap-wood small, white, soon attacked by xylophages; heart-wood brown, exudes a blackish resin.

2. **Pithecolobium angulatum,** Bth.—An evergreen tree (25—30+8—15+1½-2), the branchlets sharply 4-5-cornered, the young shoots tawny pubescent; leaves abruptly bipinnate, 1-1½ ft. long, with usually 4-3 rarely 2 pinnæ, the rachises 4-3-angled, while young tawny pubescent; leaflets of the lower pinnæ in 2-3, those of the upper ones in 4-8, pairs, on very short, thick, pubescent petiolules, more or less rhomboid-oblong to rhomboid-ovate, acuminate, 1-2 in. long, while young membranous or chartaceous and above sparingly, beneath softly tawny pubescent, when full grown thin coriaceous and especially above glabrescent; flowers small, white, on slender 1-1¼ lin. long puberulous pedicels, in umbel-like heads lengthening into short racemes borne on ⅓-¾ in. long clustered peduncles and forming a more or less ample, rusty or tawny pubescent panicle in the axils of the upper leaves and at the end of the branchlets; calyx ½ a line long, tawny pubescent; corolla 1½ lin. long, pubescent outside; pods screw-like, circinnate-twisted, linear-oblong, sinuate-contracted between the seeds, coriaceous, while young velvety, soon glabrescent.

HAB.—Frequent in the drier hill and pine forests of the Martaban hills down to Upper Tenasserim, at 4,000 to 6,000 ft. elevation.—Fl. March-Apr.; Fr. Apr.-May—l.—SS. = Metam.

3. **P. glomeriflorum,** Kz.—A shrub, 2-5 ft. high, the young shoots shortly puberulous, the branchlets slightly angular or terete; leaves abruptly bipinnate, with a single pair of pinnæ on a 1-1½ in. long petiole, the rachises hardly angular, and especially while young puberulous; leaflets in 3 or rarely 2 pairs, on very short puberulous petiolules, obliquely oblong to slightly rhomboid-lanceolate, shortly acuminate with a mucro, 1-2 in. long, thin but rigidly coriaceous, glabrous or nearly so when full grown, beneath glaucescent and conspicuously pubescent on the midrib and the nerves; flowers small, greenish white, sessile, in small heads of the size of a very small pea, on slender ½-1 in. long puberulous peduncles, clustered or solitary, forming slender puberulous racemes in the axils of the leaves or collected into leafy terminal panicles; calyx less than ½ a line long, pubescent; corolla cleft as far down as the calyx, pubescent outside, about 1½ lin. long.

Hab.—Not unfrequent in the drier hill forests of the Martaban hills east of Tounghoo, at 4,000 to 7,000 ft. elevation.—Fl. March.—s—l. × SS. = Metam.

INGA, Willd.

Flowers 5- rarely 6-merous, mostly hermaphrodite. Calyx tubular or bell-shaped, toothed or shortly lobed. Corolla tubular or funnel-shaped, valvate. Stamens numerous, long-exserted, united at the base or high up into a tube; anthers small. Ovary many-ovuled; style subulate, with a terminal small or capitate stigma. Pod straight or almost incurved, more or less dehiscing. Seeds imbedded in pulp or with an arillus-like large strophiole.—Trees or shrubs, with abruptly pinnate or bipinnate leaves. Stipules small and caducous, or rarely larger and persistent or spine-like. Flowers in peduncled heads or spikes.

4. **I. dulcis,** Willd. (*Pithecolobium dulce*, Bedd. Sylv. Madr. t. 188; Brand. For. Fl. 173).—*Kway-tanyeng*.—An evergreen tree (50—60 + 25—30 + 4—5), glabrous, or the very young branchlets greyish puberulous, the branchlets armed with short, straight, paired, stipulary spines; leaves abruptly bipinnate with a single pair of pinnæ only, on a slender ½-1 in. long petiole, glabrous; leaflets in a single pair, sessile, unequal, almost dimidiate-obovate to half-elliptical, blunt, very variable in size (from ½-1 in. long), chartaceous, glabrous, glaucescent; flowers small, whitish, sessile, in small globular heads either sessile or on very short greyish puberulous peduncles forming greyish puberulous racemes in the axils of the leaves, the racemes usually collected into a terminal panicle; calyx a line long, grey-tomentose; pods 4-5 in. long, linear-oblong, fleshy coriaceous, reddish and white, turgid, much twisted; seeds glossy black, covered with a thick, firmly spongy, rather dry but edible arillus.

Hab.—Cultivated only in the larger stations, as Rangoon.—Fl. C.S.; Fr. H.S.

ROSACEÆ.

Flowers usually regular and hermaphrodite. Calyx free and enclosing the ovaries or adnate to the ovary, the limb equal or (in *Chrysobalaneæ* unequal), 4- rarely 5- or more-lobed, with the addition (in a few genera) of as many external accessory lobes. Disk filling the calyx tube. Petals as many as true calyx-lobes, equal or rarely unequal, imbricate. Stamens indefinite, rarely few, free, inserted with the petals at the base of the calyx-lobes. Ovary of 1, 2 or more carpels, usually distinct at the time of flowering, but sometimes combined into a single 2-5-celled inferior ovary, with 1 or 2 rarely more ovules in each carpel; styles elongate or sessile; stigmas distinct. Fruit various, superior or more or less inferior, sometimes enclosed in the persistent calyx-tube, fleshy or dry, indehiscent or capsular, or the carpels collected on a fleshy or dry

torus. Albumen none, rarely present.—Trees, shrubs, or undershrubs, with simple or compound leaves. Stipules usually present. Flowers in axillary or terminal cymes or solitary, rarely in simple racemes.

An order of about 24 Burmese species, several of them trees. Apple, pear, sorb, medlar, quince, peaches, nectarines, plums, cherries, almonds, strawberries, raspberries, blackberries, and many other fruits reckon amongst this order. Astringent properties prevail. Some of them excel for the beauty of their flowers, like the roses, etc.

* *Ovary and fruit superior.*
× Calyx or its lobes usually deciduous, without bractlets. Carpel solitary; fruit a drupe; ovules 2. Trees or shrubs, with simple leaves.
○ Flowers irregular; style basilar; ovules ascending; radicle inferior . . . . . *Parinarium.*
○○ Flowers regular; style nearly terminal; ovules suspended; radicle superior.
Calyx 5-lobed; petals 5; drupe straight, with a bony putamen . *Prunus.*
Calyx 5-15-toothed; petals 5-10, minute or none; drupe often transversely oblong, coriaceous . . . . . *Pygeum.*
×× Calyx-lobes usually persistent, with or without bractlets. Carpels usually many. Fruit various.
○ Calyx-lobes without bractlets; ovules 2; stamens and carpels many; shrubs or undershrubs . . *Rubus.*
○○ Calyx-lobes with 5 bractlets. Ovule solitary.
Receptacle in fruit fleshy; herbs with 3-foliolate leaves . . *Fragaria.*
Receptacle in fruit dry; herbs or undershrubs with compound leaves . . . . . *Potentilla.*
** *Ovary enclosed in the calyx-tube or inferior. Ripe carpels within the persistent calyx-tube.*
○ Achens many, 1-seeded, dry, enclosed in the fleshy calyx-tube; shrubs, with unpaired-pinnate leaves . *Rosa.*
○○ Ovary-cells or carpels 1-5, 2-ovuled. Fruit an apple, containing a 2-5-celled putamen, or a 1-5 pyrenous drupe.
Apple 2-5-celled, the cells separate, the endocarp usually cartilaginous; deciduous trees or shrubs . . . . . *Pirus.*
Berry 1-5-celled, the endocarp and septa thin; evergreen trees . *Eriobotrya.*

PARINARIUM, Juss.

Flowers often polygamous or hermaphrodite, the females with long filiform staminodes, the males with a small abortive ovary. Calyx-tube obliquely excavated, the 5 lobes imbricate. Petals minute or none. Stamens 10 or more, all fertile or some of them without anthers, hypogynous, the filaments short and persistent. Ovary of a single carpel sessile on the bottom of the calyx, 1-celled with 2 erect ovules; style lateral from the base; stigma large peltate. Drupe succulent, rarely almost dry, surrounded at the base by the persistent calyx, the stone bony, usually 2-seeded. Albumen none.—Trees or shrubs, with alternate simple leaves.

Stipules minute or none. Flowers often polygamous, solitary or more usually in axillary or terminal bracted racemes or panicles.

1. **P. Sumatranum,** Bth.—A middling-sized tree, the younger shoots all tawny pilose; leaves of the shoots longer acuminate, more membranous, beneath densely and shortly white or gilvous tomentose, the older ones oblong or broadly oblong, on a short thick tomentose petiole, blunt or apiculate, entire or nearly so, firmly coriaceous, glabrous above, minutely greyish tomentose and strongly nerved and net-veined, very variable in size, but usually 4-6 in. long; flowers shortly pedicelled, villous, forming tomentose or pubescent racemes or thyrsoid racemes in the axils of the leaves and sometimes at the end of the shoots; the lower bracts oblong-lanceolate and puberulous, those further up gradually smaller and shorter; stamens about 15, forming a half-circle, the lower fertile (7-8) ones short, the upper sterile ones without anthers and united into a minutely toothed crown; ovary scaly and minutely hairy; drupes oblong, the size of a plum, rough from lenticels and scales, yellow, the mesocarp sappy and edible.

HAB.—Burma, without locality (probably Tenasserim).

PRUNUS, L.

Flowers hermaphrodite. Calyx-tube from tubular to urceolate, filled up with the glandular disk. Sepals 5 (rarely 4 or 6), inserted at the throat of the tube, deciduous, imbricate. Petals as many as sepals, or none, deciduous, imbricate. Stamens 10-20, or sometimes more. Carpel solitary (rarely 2 or more), free, inserted on the bottom of the calyx-tube, with 2 descending ovules; style terminal. Fruit a drupe, more or less sappy, the putamen hard, perforated, usually 1-rarely 2-seeded. Albumen thin or none.—Trees or shrubs, with alternate simple leaves. Stipules present. Flowers solitary or more usually corymbose or racemose.

* Fruits large, tomentose; leaves deciduous, serrulate . *P. Persica.*
* * Fruits smooth.
Leaves deciduous, serrate; flowers in poor corymbs; calyx-tube about 4 lin. long . . . . . *P. Puddum.*
As preceding; flowers small, by threes; calyx-tube only 1-1½ lin. long . . . . . *P. triflora.*
Leaves persistent, entire; flowers racemose . . . . . *P. Martabanica.*

1. **P. Persica,** Bth.; H.f. Brand. For. Fl. 191.—A leaf-shedding small tree, the leaf-buds sparingly pilose; leaves oblong-lanceolate to lanceolate, rounded and 2-glandular at the base, crenate-toothed, on a 3-4 lin. long petiole, more or less acuminate, 2-3½ in. long, chartaceous, glabrous; flowers showy, white or pale-rose-coloured, shortly pedicelled, singly arising from imbricate-scaled buds;

calyx-tube glabrous, the lobes elliptical, blunt, nearly 3 lin. long, woolly villous along the borders and inside; petals obovate, ½ in. long; drupes the size of a large plum, ovoid, pointed, gilvous tomentose, fleshy and edible.

Hab.—Cultivated in Ava about Bhamo and in the Kakhyen hills, up to 3,500 ft. elevation.—Fl. Febr.-March; Fr. June-July.

2. **P. triflora,** Roxb.—A small bushy tree, shedding leaves in C.S., all parts glabrous; bark smooth, blackish; leaves obversely lanceolate, 2-glandular at the acuminate base, on a slender petiole about ½ in. long, shortly acuminate, minutely crenulate, 2-3 in. long, membranous, glabrous; stipules lanceolate, glandular-fringed; flowers rather small, white, on slender glabrous pedicels ½ in. long, usually arising by threes from every leaf-bud; calyx glabrous, the tube turbinate, the lobes longer than the tube, more than a line long, ovate, acute, glandular on the margins; petals ⅓ in. long, broadly oboval, very shortly clawed; filaments about 30; stigma large; drupes cordate-ovoid, the size of a plum, dark-purple, pruinose, grooved on one side, the pulp pale-reddish yellow.

Hab.—Ava hills.

3. **P. Puddum,** Ldl.; Brand. For. Fl. 194.—A leaf-shedding tree, all parts glabrous; leaves lanceolate, rounded at the 3-4-glandular base and somewhat narrowed in a 4-5 lin. long petiole, long-acuminate, 2-3 in. long, sharply and usually duplicately serrate, glabrous, chartaceous; flowers middling-sized, rose-coloured, on ½ in. long pedicels forming a few flowered glabrous much-bracted corymb above the axils of the fallen leaves; calyx glabrous, the tube bell-shaped-tubular, about 4 lin. long, the lobes short, acute; drupes globular, the size of a small cherry, on a long pendulous peduncle, smooth, yellow, dark-red on the sun-side.

Hab.—Ava, Kakhyen hills, east of Bhamo.

3. **Pr. Martabanica,** Kz.—An evergreen tree (50—60 + 20—30 + 6—7), all parts quite glabrous; bark very thin, fibrous, brown; leaves from elliptically oblong and oblong to ovate-oblong, rounded or acuminate at the base, on a terete sulcate petiole ¼ or more usually ½ in. long, acuminate, 5-7 in. long, entire, firmly membranous or almost coriaceous, quite glabrous and glossy above, beneath sprinkled with pellucid, in a dried state black, dots; flowers small, white, on 2 to 3 lin. long pedicels, forming axillary, glabrous, or puberulous racemes of about 1½ to 2 in. length; petals about a line long; drupes rather dry, elliptically oblong, ⅔-1 in. long, smooth, the putamen thin, hard, almost crustaceous.

Hab.—Rather frequent in the tropical and moister upper mixed forests of the Andamans; also Tenasserim.—Fr. May.—s.—SS.=SiS.

Remarks.—Wood uniformly dark-yellow, rather coarse, fibrous, very heavy.

PYGEUM, Gaertn.

Flowers hermaphrodite or polygamously dioecious. Calyx-tube concave. Sepals 5-15, tooth-like, short. Petals as many, small, conform with the sepals, or none; stamens 10-20. Ovary sessile, 1-celled, with 2 descending ovules; style terminal with a capitellate stigma. Fruit a dry drupe, usually transversely oblong, 1-seeded. Seeds transversely oblong. Albumen none.—Evergreen trees or shrubs, with alternate simple leaves. Stipules small, deciduous. Flowers in axillary and lateral racemes.

× Ovary and leaves beneath more or less tawny villous . *P. arboreum.*
×× Ovary glabrous or sparingly hirsute.
Quite glabrous; nerves and veins conspicuous, all deeply immersed, and the surface of the leaves appearing almost wrinkled . . . . . *P. acuminatum.*
Younger branchlets, petioles, and nerves beneath pubescent; nerves and veins thin, little visible . . . . . *P. persimile.*

1. **P. arboreum,** Endl.—A tree, the younger branches and buds rusty tomentose, the older ones glabrous and lenticellate; leaves ovate-oblong to broadly oblong, shortly cuspidate, on a 2-4 lin. long brown tomentose petiole, entire or nearly so, 4-6 in. long, rigidly chartaceous or almost coriaceous, above glabrous or rusty tomentose, on the impressed conspicuous nerves almost wrinkled, beneath more or less brown-pubescent or almost tomentose; flowers small, on 1-1½ lin. long pedicels, forming rusty tomentose 2-3 in. long racemes arising usually by 2 or 3 from above the axils of the fallen leaves; calyx-teeth minute; petals hardly longer, villous; ovary densely rusty villous; drupes transversely oblong and almost didymous, nearly ½ an in. across, covered with fugaceous rusty-brown stiff hairs and soon glabrescent.

Hab.—Martaban hills down to Tenasserim, at 3,000 to 4,000 feet elevation.

2. **P. acuminatum,** Colebr.—A large tree with a trunk of 5-6 ft. girth, the leaf-buds puberulent; leaves from ovate and oblong-lanceolate to broadly oblong, on a glabrous, slender petiole 3-4 lin. long, usually unequally acute at the base, entire or nearly so, shortly acuminate or cuspidate, rigidly chartaceous, 4-5 in. long, glabrous, with the nerves and veins very conspicuous and impressed, strongly net-veined and almost wrinkled, beneath rusty-coloured with the nerves sharply prominent; flowers small, on 1½ lin. long pedicels, in puberulous 1-2 in. long, racemes elongating in fruit and arising singly from the axils of the leaves and from the branches; ovary glabrous or nearly so; drupes transversely oblong, glabrous, nearly ⅔ in. broad.

Hab.—Chittagong.

Remarks.—Wood red, adapted for cabinet-work.

3. **P. persimile**, Kz.—An evergreen tree, the younger branchlets slightly appressed pubescent or puberulous; leaves elliptical to elliptically lanceolate, on slender rusty-pubescent petioles about 3 lin. long, obtuse at the base, bluntish and often very long acuminate, entire, 2-3½ in. long, almost membranaceous, above glabrous or minutely pubescent on the impressed thin nerves, beneath appressed pubescent along the midrib; racemes densely tawny tomentose or almost woolly, arising usually by 2-3 from above the scars of the fallen leaves or irregularly from the branches; pedicels only ½ lin. long; calyx-tube short, urceolate, like all other parts tawny tomentose; ovary densely tawny hirsute; style long, exserted, the stigma broad.

Hab.—Tenasserim.

RUBUS, L.

Calyx open, 5-lobed, the lobes without external accessory bracts, imbricate. Petals 5. Stamens usually indefinite, inserted on the mouth of the calyx; filaments filiform; anthers didymous. Carpels indefinite, each with 2 suspended ovules, of which one abortive; style terminal. Fruit a head of succulent rarely dry carpels forming usually a spurious granulated berry round the dry or spongy receptacle.—Shrubs, usually scrambling and prickly, rarely erect, with simple, lobed, or compound leaves. Flowers axillary or in terminal leafy panicles.

* *Carpels few (only 3-6), dry; leaves simple* . . . . *R. pyrifolius.*
** *Carpels numerous, forming a sappy spurious berry.*
○ Leaves simple or lobed.
+ All parts and leaves beneath covered with a tomentum more or less mixed with longer hairs. Calyx-lobes entire.
Bracts and stipules entire or subulate-toothed, sometimes very deeply so, and then the lobes very short . . . . . *R. rugosus.*
Bracts and stipules pinnately cut, the segments long, thin, and often filiform . . . . . *R. Moluccanus.*
++ All parts, except inflorescence, without tomentum, rather glabrous or pubescent; calyx-lobes pectinate-toothed . . . . . *R. ferox.*
○○ Leaves digitately or pinnately compound.
+ Leaves digitately 3- or 5-foliolate; leaflets green, slightly pubescent or glabrescent . . . *R. pentagonus.*
++ Leaves pinnately 3-foliolate or pinnate.
Leaves pinnately 3-foliolate; leaflets beneath white or yellowish tomentose; flowers white; fruits glabrous . . . *R. flavus.*
Leaves unpaired-pinnate; leaflets beneath white or yellowish tomentose; flowers red or rose-coloured; fruits tomentose . *R. lasiocarpus.*
Leaves unpaired-pinnate; leaflets uniformly green; flowers white; fruits glabrous . . . . . *R. rosæfolius.*

1. **R. pyrifolius**, Sm.—A large scrambling shrub, more or less sprinkled with minute recurved prickles, the branchlets terete,

tomentose or pubescent; leaves oblong to elliptically rarely ovate-oblong, acuminate or acute, on a short recurved-prickly villous petiole 2-4 lin. long, obtuse or rounded at the base, not, or rarely coarsely serrate-lobed, toothed, 3-5 in. long, rather coriaceous, the pubescent nerves excepted glabrous, or the veins beneath sprinkled with hairs and the midrib armed with a few recurved prickles; flowers white, on slender 2-3 lin. long pubescent pedicels, forming pubescent tomentose panicles in the axils of the upper leaves and more ample ones at the end of the branches; bracts and stipules pinnatifid, the segments linear-subulate, slightly pubescent; calyx velvety-tomentose or pubescent, the lobes entire, subulate-acuminate; petals nearly half as long as the calyx-lobes; carpels as large as a pepper-kernel, by 3-6 on the short villous torus, ovate, acuminate, glabrous, succulent, red.

HAB.—Ava, Kakhyen hills.—Fl. Fr. March.

2. **R. Moluccanus,** L.—A large scrambling shrub, armed with numerous small recurved prickles, the branches and petioles terete and clothed with a short rusty or whitish woolly down often mixed with longer hairs, or softly pubescent; leaves from broadly cordate-ovate to cordate-rotundate, on a tawny pilose prickly petiole 1½ to 2 in. long, shortly and broadly 3- or 5- rarely 7-lobed, with the lobes blunt or acute (the basal ones diverging or converging), toothed or serrate-toothed, 3-4 in. long, acute or sometimes long-acuminate, above more or less wrinkled and rough from inconspicuous hairs, rarely pubescent, beneath lacunose-net-veined, rusty or whitish tomentose, and on the principal nerves usually armed with a few straight prickles; flowers white, on 2-3 lin. long pedicels, irregularly clustered and shortly panicled in the axils of the leaves, the upper ones forming a terminal usually very silky villous panicle; bracts and stipules very deciduous, deeply pinnatifid, the segments linear or filiform; calyx densely appressed hirsute or simply velvety, the lobes acuminate or acute, 3-4 lin. long, fruit almost globular, bright-red, glabrous, slightly acid.

HAB.—Frequent in the drier hill forests and hill toungyas of Martaban; also Ava hills.—Fl. Feb.-March.—l.—SS.=Metam.

3. **R. ferox,** Wall.—A tall scrambling shrub, armed with short recurved prickles, the terete branches and petioles tawny pubescent; the older ones more or less glabrescent; leaves from cordate-ovate to cordate-oblong, acuminate, on a 2-3 in. long more or less prickly pubescent petiole, usually shortly 3-5-lobed, with the lobes obsolete and blunt (or in luxuriant forms acute), flat, unequally and sharply serrate-toothed, membranous, 4-6 in. long, sprinkled with a few hairs or almost glabrous, the principal nerves often pubescent and beneath sparingly prickly; flowers white, on 4-5 lin. long pubescent

pedicels, forming irregular tawny pubescent racemes or short panicles in the axils of the leaves or loose elongate panicles at the end of the branches; calyx canescent or velvety and sparingly appressed hirsute, the lobes acuminate, either all or the 3 larger ones pectinate-toothed, the teeth more or less linear or subulate; fruits globular, glabrous, of the length of the sepals.

Hab.—Burma, probably Ava.

4. **R. pentagonus,** Wall.—A large scrambling shrub, armed with compressed, strong, recurved prickles, the branchlets glabrous and terete; leaves digitately 3- or 5-foliolate, on a 1½-2 in. long sulcate more or less pilose petiole; leaflets lanceolate to broadly lanceolate (especially the median one), cuneate at the base, sessile, acuminate or caudate-acuminate, irregularly serrate-toothed, membranous, turning chartaceous, 2-3 in. long, glabrous, with the nerves tawny pubescent, or both surfaces shortly appressed pubescent and the nerves pilose, the midrib beneath sparingly prickly; flowers white, on moderately long glandular-pilose pedicels, solitary or in poor axillary or terminal peduncled panicles; bracts and stipules linear, glabrous or glandular, the former often somewhat cut or cleft; calyx velvety and, while young, appressed bristly hirsute, the lobes broadly lanceolate, subulate-acuminate, white-tomentose inside; fruits glabrous, sappy, red, shorter than the calyx.

Hab.—Not uncommon along hill streams in the damp hill forests of the Nattoung hills, Martaban, at 6,000 to 7,200 ft. elevation.—Fl. March-Apr.—s.—SS.=Metam.

5. **R. flavus,** Ham.; Brand. For. Fl. 197.—A bushy erect shrub, 3-4 ft. high, armed with scattered strong recurved prickles, the branches somewhat 5-cornered, covered with a whitish or yellowish pubescence intermixed with numerous long, spreading, brown, bristly hairs; leaves pinnately 3-foliolate, on an 1-2 in. long pubescent prickly petiole; leaflets obovate or almost orbicular, the lateral ones almost sessile, truncate or rounded and usually mucronate, serrate-toothed, firmly chartaceous, very variable in size, usually 1-2 in. long, strongly parallel-nerved (the nerves and veins impressed on the upper side), glabrous above, beneath densely and shortly tomentose-pubescent, whitish or yellowish, rarely green; flowers white, on slender pubescent and spreadingly setose pedicels, forming long-peduncled corymbs in the axils of the upper leaves and arranged into larger or smaller panicles at the end of the branches; bracts and stipules linear-subulate, pubescent; calyx velvety pubescent, often bristly towards the base, the lobes broad and more or less acute; petals sparingly appressed pubescent, longer than the calyx-lobes; fruits hemispherical, glabrous, yellowish, shorter than the calyx.

Hab.—Martaban and Ava hills.—Fl. Febr.-March.

6. **R. lasiocarpus,** Sm.; Brand. For. Fl. 198.—A large scrambling or decumbent shrub, armed with straight sharp prickles, the younger branchlets puberulous or pubescent; leaves unpaired-pinnate, the rather short petiole and rachis terete, pubescent and armed with recurved prickles; leaflets in 4-3 (the upper ones in fewer) pairs with an odd one, almost sessile, oblong to oblong-lanceolate and ovate, acuminate or acute, rarely blunt, irregularly and rather coarsely serrate, above green and glabrous or appressed pubescent, beneath covered with a white or yellowish, short, woolly tomentum, and strongly parallel-nerved; flowers red or rose-coloured, on rather long or short densely pubescent pedicels, forming rather dense, pubescent, short, corymbose panicles at the end of the branches, or long-peduncled poor corymbs in the axils of the leaves; bracts and stipules linear, entire; calyx pubescent-tomentose, the lobes acuminate or subulate-acuminate; petals shorter than the calyx, rotundate; fruits hemispherical, longer than the calyx, reddish, densely often greyish puberulous.

Hab.—Martaban, Karen hills.

7. **R. rosæfolius,** Sm.; Brand. For. Fl. 198.—A prostrate or ascending shrub, armed with numerous sharp straight prickles, the branches terete, sometimes somewhat pruinous and more or less covered with very long dark-coloured stiff hairs bearing on their curved apex a conspicuous gland, rarely the branches all glabrous or shortly glandular-pubescent; leaves unpaired-pinnate, the petiole and rachis similarly clothed like the branches, but the prickles hooked-recurved; leaflets usually in 3 (rarely in 4-2) pairs with an odd one, very shortly petioluled, ovate- or oblong-lanceolate, acuminate, coarsely and usually irregularly serrate-toothed, usually 1-2 in. long, firmly membranous, sparingly pubescent or almost glabrous, or glandular-pubescent, uniformily green, the strong nerves parallel, the midrib prickly beneath; flowers white, long-pedicelled, forming very poor terminal or axillary corymbs, or often solitary and leaf-opposed; bracts and stipules linear-subulate; calyx from almost glabrous to hirsute-tomentose, the lobes subulate-acuminate; petals spreading; fruit elongate-ovoid, yellow, glabrous, much longer than the calyx.

Hab.—Not uncommon in the drier hill forests and hill toungyas of Martaban, at 3,000 to 4,000 ft. elevation; also Ava hills.—Fl. April.—l.

ROSA, L.

Calyx-tube globose or ovoid, contracted in a longer or shorter neck, the limb 5-lobed. Petals 5. Stamens numerous. Ovary of several or many distinct carpels enclosed in the calyx-tube, with a solitary suspended ovule in each, the styles protruding from the

tube and sometimes united. Ripe carpels dry and hairy, sometimes surrounded with pulp and enclosed in the more or less succulent calyx-tube, forming a spurious berry.—Erect or climbing shrubs, rarely small trees, usually prickly armed, with unpaired-pinnate leaves. Stipules leafy, adherent to the petiole. Flowers showy, solitary or in small terminal corymbs or panicles.

* *Styles united in a column. Flowers corymbose.*

Flowers small, pink; calyx glabrous or pubescent, the lobes short and entire; leaflets small, pubescent beneath; stipules pinnatifid . . . . . *R. multiflora.*

Flowers large, white; calyx glandular-tomentose, of the lobes usually one or more lobed; leaflets glabrous; stipules entire . *R. moschata.*

* * *Styles free.*

○ Calyx-throat not closed by the disk.

Flowers large, usually corymbose; calyx glabrous or sparingly glandular; leaflets glabrous, glaucous beneath; ovaries about 40-50 . . . . . *R. Indica.*

As former, but flowers solitary; ovaries only about 15 . . *R. damascena.*

Flowers solitary; calyx-tube and the globose fruit densely echinate; leaflets small . . . . . *R. microphylla.*

○ ○ Calyx-throat completely closed by the disk.

Calyx and branchlets, and also the globose fruits, densely tomentose . . . . . *R. involucrata.*

Calyx and peduncles hispid; leaflets wrinkled, opaque . . . *R. rubiginosa.*

1. **R. involucrata,** Roxb.—A meagre straggling shrub, the branches more or less tomentose and armed with compressed, strong, straight prickles; stipules downy, the borders divided into several compound capillary segments, here and there fringed with glands; leaves unpaired-pinnate, the petiole and rachis tomentose and furnished with a few straight thin prickles; leaflets in 3-4 pairs with an odd one, elliptical or elliptically-oblong, blunt or acute, very shortly petioluled, chartaceous, toothed, about 1-1½ in. long, glabrous and somewhat glossy above, more or less tomentose beneath; flowers large, white, terminal, either solitary or usually by 3-5 together, on short densely tomentose pubescent pedicels and usually surrounded by 3 or 4 approximated leaves; calyx densely whitish tomentose, pubescent, the lobes lanceolate, entire and subulate-acuminate; bracts greyish tomentose, linear, the borders cut into several linear segments; petals notched, about an inch long; disk large and thickened, long; styles villous, a little exserted; fruits globular, thick, tomentose.

Hab.—Ava, in the savannahs of the Irrawaddi valley from Mandalay northwards.—Fl. Febr.-March.—l.—SS.=All.

Many other species of roses are found cultivated around khyouks of Burma, amongst which *Rosa damascena* and *R. Indica* (if really distinct from one another) are the more common. I have given above a conspectus of the species found cultivated, but it is not necessary to describe them here.

PIRUS, L.

Calyx-tube urceolate or rarely turbinate, adnate to the carpels and produced beyond them, the lobes reflexed, persistent or deciduous. Petals 5, shortly clawed. Stamens numerous, the filaments free or united at the base. Ovary inferior, 2-5-celled, with 2 or rarely more ascending ovules in each cell, the styles distinct or united at the base. Fruit fleshy, crowned with the persistent calyx or the scar of the fallen limb, 2-5-celled, the cells usually distinct, with 1 or 2 or rarely more erect seeds in each, the endocarp cartilaginous or rarely crustaceous or bony and firmly adhering to the sarcocarp.—Trees or shrubs, with alternate, simple, or pinnate deciduous leaves. Stipules deciduous. Flowers usually in terminal cymes or corymbs, rarely solitary or clustered. Bracts subulate, deciduous.

* Ovules more than 2 in each cell; flowers solitary or by pairs . . . . . *P. Indica.*

* * Ovules 2 in each cell. Flowers in corymbs or cymes.

Flowers (and fruits) on slender 1-2 in. long pedicels . . . *P. Pashia.*

(Flowers and) fruits on very short thick peduncles . . . *P. granulosa.*

1. **P. Indica,** Colebr.—A small leaf-shedding tree, the young shoots white-woolly; leaves from oblong-lanceolate to oval-oblong and elliptical, on a slender ½-¾ in. long petiole, shortly acuminate, obsoletely and minutely crenate-toothed, 1½-2½ in. long, coriaceous, while young white-woolly beneath, more or less glabrescent; flowers white, middling-sized, on 2-4 lin. long white-woolly pedicels, usually by 2-3 or solitary in the axils of the young leaves; calyx densely white-woolly, the tube about 3 lin. long, the lobes somewhat longer, lanceolate, or linear-lanceolate, acuminate; petals about ½ in. long; apples more or less ovoid or rarely somewhat pear-shaped or globose, yellow, smooth, 1½-2 in. long, crowned by the persistent calyx-limb.

Hab.—Ava, Kakhyen hills, east of Bhamo.—Fl. March-April; Fr. Sept.-Oct.

2. **P. Pashia,** Don. (*P. variolosa,* Wall.; Brand. For. Fl. 204).—A tree about 25 ft. high, shedding leaves in C.S., the young shoots covered with a loose fugaceous white-woolly tomentum; leaves oval-oblong and ovate, on a long slender petiole, acute, crenate-toothed, membranous, thin chartaceous, 2-3 (sometimes 4-5) in. long, glabrous, turning black in drying; flowers white, on 1-1½ in. long straight, slender, whitish woolly, glabrescent pedicels, forming a short peduncled or almost sessile corymb in the axils of the young leaves; apples as large as a bullet, globose, yellow, sprinkled with whitish pustules, on a 1½-2 in. long straight peduncle, very acerb, when over-ripe turning sweet and black.

Hab.—Ava, Kakhyen hills.—Fl. March; Fr. Aug.

3. **P. granulosa,** Bert.—A tree (24—30+6—12+2—3), shedding leaves in C.S., all parts glabrous; leaves ovate to ovate-oblong, unequal at the acute base, on a glabrous petiole about an inch long, acuminate, 4-5 in. long, almost coriaceous, especially towards the apex serrate-toothed, entire or nearly so towards the base, glabrous, not blackening in drying; apples as large as a small bullet, globular, sprinkled with white pustules, turning purplish black in ripening, very shortly and strongly peduncled, in a small, poor, robust cyme at the end of the branchlets and in the axils of the upper leaves.

Hab.—Not unfrequent in the stunted drier hill forests of the Nattoung, Martaban, at 7,000 ft. elevation.—Fr. March.—l.—SS.=Metam.

ERIOBOTRYA, Ldl.

Calyx-tube bell-shaped or turbinate, adnate to the ovary or free towards the 5-lobed limb. Petals 5. Stamens up to 20, inserted in the throat of the calyx-tube; filaments subulate. Ovary inferior or free at the apex, 2-5- or rarely 1-celled, with 2 erect ovules in each cell; styles as many as cells, free or more or less united at the base. Drupe or berry ovoid, 1-5-celled, the septa membranous or chartaceous, sometimes obliterated, the cells 1- or 2-seeded. Seeds erect.—Evergreen trees or shrubs, with alternate, simple, coriaceous leaves. Stipules sometimes almost leafy. Flowers small or middling-sized, in terminal corymbs or panicles.

× Leaves entire. Flowers in corymbs.
Calyx and inflorescence puberulous; berries the size of a pea . *E. integrifolia.*
Inflorescence glabrous; apple of the size of a bullet . . . *E. macrocarpa.*
×× Leaves coarsely crenate-serrate. Panicles rusty woolly-tomentose.
Leaves glabrous; calyx about a line long; berries not edible . *E. dubia.*
Leaves woolly tomentose beneath; calyx 3-4 lin. long; berries the size of a plum, edible . . . . . *E. Japonica.*

1. **E. integrifolia,** Kz. (*Photinia Notoniana,* Wall.; Bedd. Sylv. Madr. t. 192).—An evergreen tree 30-40 ft. high, remaining stunted in higher regions, all parts glabrous; leaves oblong to cuneate-oblong, acute at the base, on an 1-1½ in. long thick petiole, acuminate to acute, entire or with a few inconspicuous teeth, very coriaceous, 4-5 in. long, glossy above, the nerves and veins impressed above and prominent and strong beneath; flowers small, white, on short thick puberulous pedicels, forming a large terminal puberulous corymb; calyx about ½ lin. long, glabrous or slightly puberulous, the teeth minute; styles 2; berries nearly globular, the size of a pea, glabrous, 2-celled and 2-seeded.

Hab.—Frequent in the stunted drier hill forests of the Nattoung hills, Martaban, at 7,000 to 7,200 ft. elevation.—Fr. March.—l.—SS.=Metam.

2. **E. macrocarpa,** Kz.—An evergreen tree (30—40+10—15+2—3), all parts glabrous; bark blackish, rough; leaves from obovate to oblong-lanceolate, tapering in a short ½-⅔ in. long strong petiole, shortly and bluntish acuminate, quite entire, 5-6 in. long, coriaceous, smooth and glossy; flowers unknown; fruiting peduncles very thick and simple, only 1-3 in. long, glabrous, in the axils of the upper leaves and at the end of the thick branchlets; fruit a more or less globose apple of the size of a bullet, glabrous, crowned with the calyx-limb.

Hab.—Rare in the tropical forests of the north-eastern slopes of the Kambala toung, Pegu Yomah, at about 2,000 to 3,000 ft. elevation.—Fr. March-Apr.—s.—SS.=SiS. (?)

3. **E. dubia,** Kz.—An evergreen tree (60—70+ (?) +4—5), the young shoots rusty woolly-tomentose; leaves oblong and oblong-lanceolate to lanceolate, acute or acuminate at the base, on rather long (those of the uppermost leaves short and thickened) petioles, acuminate or acute, coarsely crenate-serrate, coriaceous, 7-9 in. long, glabrous, the nerves sharply prominent beneath; flowers rather small, on short thick pedicels supported by short very deciduous bracts and bractlets, disposed in a rusty-woolly-tomentose terminal panicle; calyx about a line long, rusty tomentose, the lobes nearly as long as the tube, acute; berries obovoid, 1-2-seeded, not edible.

Hab.—Frequent in the hill forests, especially the moister ones, of the Nattoung hills, Martaban, at 6,000 to 7,000 ft. elevation; Chittagong; Ava, Kakhyen hills.—Fl. March.—s.—SS.=Metam.

Remarks.—Wood light-brown.

N. B.—**E. Japonica,** Ldl.,—the loquat—is found occasionally cultivated in gardens.

SAXIFRAGEÆ.

Flowers usually hermaphrodite and regular. Calyx 5-rarely 4-12-merous, free or adnate to the calyx, the lobes valvate or imbricate. Petals usually 4 or 5, rarely none, perigynous rarely epi- or hypo-gynous, imbricate or valvate. Stamens as many or twice as many as petals, rarely indefinite; filaments free; anthers usually didymous. Intrastaminal disk often present and sometimes passing into staminodes or glands. Ovary more or less adnate to the calyx, or if free usually attached to a broad base, either 2- to 5-celled or with 2 to 5 parietal placentas, very rarely contracted at the base or apocarpous, with several or very rarely a solitary ovule in each cell or to each placenta; styles as many as ovary-cells, free or rarely united. Fruit a capsule or rarely berry-like and indehiscent. Seeds usually small, with or rarely without albumen. Embryo straight, small or rarely rather large.—Herbs, rarely shrubs or

trees, with alternate or opposite, simple or compound leaves. Stipules present or not.

POLYOSMA, Bl.

Calyx-tube ovoid, adnate to the ovary, the limb 4-toothed. Petals 4, valvate, strap-shaped, often cohering in a tube, deciduous. Stamens 4; anthers linear, erect. Ovary inferior, 1-celled, the numerous ovules attached to the 2 parietal placentas which protrude far into the cell and almost divide it into two; style filiform; stigma terminal, entire. Berry inferior, 1-seeded. Seed erect, large, the testa rather thick. Embryo small, at the apex of a fleshy albumen.—Trees, with simple leaves opposite or nearly so. Flowers in simple terminal racemes or spikes.

1. **P. Wallichii,** Benn.—An evergreen small tree, about 25-30 ft. high, the young shoots tawny pubescent; leaves obovate-lanceolate to oblanceolate-oblong, acute at the base, on a slender petiole ½-1 in. long, shortly and rather abruptly acuminate, remotely and slightly serrate while young, afterwards thickened-toothed by the excurrent nerves, 3-5 in long, chartaceous, slightly pubescent on the nerves beneath; flowers ⅓ in. long, on greyish puberulous 1-bracted peduncles not above a line long, forming slender pubescent terminal racemes; calyx-teeth ovate, acute; corolla puberulous.

Hab.—Tropical forests of the Andamans.—Fl. R.S.

Remarks.—Wood rather light, pale-brown, pretty straight-fibrose, rather close-grained, soft.

HAMAMELIDEÆ.

Flowers regular or irregular, hermaphrodite or unisexual. Perianth in male flowers sometimes wanting. Calyx-tube more or less adnate to the ovary, the limb truncate or 4-5-lobed, valvate or imbricate. Petals as many, more or fewer than calyx-lobes, or none. Stamens 4 or more, definite or indefinite, perigynous, 1-seriate; filaments free; anthers 2-celled, the cells opening laterally in various ways. Ovary inferior or half-inferior, rarely superior, consisting usually of 2 or rarely more carpels, usually free at the apex and beaked, with 2 suspended ovules in each carpel or rarely more on axile placentas; style usually persistent. Fruit a capsule, the carpels usually diverging at the apex, and each one opening in 2 short valves. Albumen thin, fleshy.—Trees or shrubs, with usually alternate, simple or 3-lobed leaves. Stipules deciduous or persistent. Flowers small, usually collected in heads, rarely racemose or spicate.

A small order, of which only 2 species are found in Burma, but no doubt others will be discovered in the Ava hills. Storax, a

fragrant resin, is the yield of several species of *Liquidambar* and *Altingia*. The bark of some is astringent.

Petals in hermaphrodite flowers linear; leaves persistent . . *Bucklandia.*
Petals none; leaves deciduous, glandular-serrate . . . *Altingia.*

BUCKLANDIA, R. Br.

Flowers polygamous, in heads, the calyces confluent. Calyx-tube almost bell-shaped, adhering to the ovary, the limb repand-5-lobed. Petals in hermaphrodite flowers linear-spatulate, often transformed into stamens, in females reduced to 4 in number and rudimentary. Stamens 10 to 14 (in females none), the filaments unequal, subulate; anthers unequally 2-valved, the connective apiculate. Ovary semi-inferior, 2-cleft at the summit, 2-celled, with 6 ovules in each cell arranged in 2 rows; styles 2, recurved, thick. Capsule nearly free, woody, 2-valved and 2-celled, the valves 2-cleft, the cells up to 6-seeded. Seeds partially without embryo, the fertile ones winged upwards. Albumen thin, fleshy.—Trees, with alternate, simple or 3-lobed leaves. Stipules large, coriaceous, deciduous. Flower-heads in peduncled corymbs, 10-20-flowered.

1. **B. populnea**, R. Br.—An evergreen tree (60—80+18—40+5—6), remaining stunted in higher regions, the very young shoots fugaceously rusty pubescent; leaves broadly ovate to nearly cordate, truncate at the base, on a 1-2 in. long thick petiole, acuminate, entire, simple or (on the younger branches) cuspidately 3-lobed, very coriaceous, glossy above, glabrous; stipules large, oblong, blunt, somewhat pruinous; flower-heads small, greenish, compact, on thick pretty long peduncles covered with a rusty or rather copper-coloured pubescence, forming sessile or almost sessile corymbs in the axils of the leaves; capsules as large as a pea, almost globular seated on the cup-shaped calyces united in a solid head.

Hab.—Frequent in the hill forests, especially the damp ones, of the Martaban hills, at 4,000 to 7,200 ft. elevation.—Fl. March.—s.—SS.=Metam.

Remarks.—Wood red-brown, rather heavy, fibrous, but close-grained, rather hard, apparently soon attacked by xylophages.

ALTINGIA, Noronh.

Flowers unisexual, in heads supported by a single bract. Males: calyx and corolla none. Stamens packed into a globular head, the filaments short; anthers 4-cornered. Females: calyces confluent, without limb; petals none. Anthers rudimentary. Ovary half-inferior, 2-celled, with many ovules attached to the axile placenta of each cell, the carpels produced into subulate recurved caducous styles. Capsules opening at the summit in 2 valves, firmly cohering and forming an indurated globular many-capsuled head. Seeds

all but one sterile, the fertile lowermost one winged-angular. Albumen scanty.—Large trees, with alternate simple glandular-serrate deciduous leaves. Stipules very deciduous or persistent. Flower-heads small, the male ones racemose, the female ones solitary.

1. **A. excelsa,** Noronh.—*Nan-ta-yop.*—A leaf-shedding tree (150—180+80—100+15—20), all parts quite glabrous; leaves oblong to ovate-oblong, on a slender glabrous petiole, rounded at the base, acuminate, glandular-serrate, chartaceous, glabrous, conspicuously nerved, 4-5 in. long; male flower-heads almost sessile, each supported by a rather large, solitary, broad, silky-pubescent bract, forming a sort of catkin; female flower-heads long-peduncled, solitary, axillary; capsule almost immersed in the confluent calyces and forming a globular velvety-tomentose areolate rather woody fruit.

Hab.—Tenasserim, locally quite abundant; Ava, Khakyen hills.—Fr. March.—s : l.—SS.=Metam.

Remarks.—Wood brown, very hard, close-grained, oily, of a somewhat balsamic odour. Yields a kind of storax (Kandei *Sund*). Dr. Mason states that a considerable stream in the province of Mergui derives its name from this tree, in consequence of its growing so thickly on its banks.

RHIZOPHOREÆ.

Calyx-tube usually adnate to the ovary, sometimes produced beyond it, rarely quite free, the limb 4-14-lobed, valvate. Petals as many as calyx-lobes and alternating with them, the margins usually induplicate and embracing the stamens. Stamens as many or twice as many as petals or more, inserted with them at the base of the free part or lobes of calyx; anthers erect or versatile, 2-celled, opening longitudinally. Ovary more or less inferior or rarely quite superior, 2- or more-celled, with 2 or few pendulous ovules in each cell, or rarely 1-celled by obliteration of the partition; style simple, with an entire or lobed stigma. Fruit inferior or enclosed in the calyx. Seeds solitary or few, with or without albumen.—Trees or shrubs, with opposite, simple, usually glossy leaves. Flowers axillary, solitary, clustered or in cymes.

The *rhizophors* form an important agency in binding the muddy shores of tropical countries, especially along estuaries. The bark, etc., of many is astringent and good for tanning purposes; it is also often used for dyeing black. The timber of *Bruguiera* and others is hard and durable.

* *Ovary inferior.*

× Seeds without albumen, germinating while still on the tree, the radicle enlarging rapidly and protruding to a great length from the summit of the capsule. Saline trees or shrubs.

Calyx 4-cleft; petals entire; ovary 2-celled, with 2 ovules in each cell . . . . . *Rhizophora.*
Calyx 5-6-cleft; petals notched and appendaged; ovary 3-celled, with 2 ovules in each cell . . . . . *Ceriops.*
Calyx 5-6-cleft; petals shagged; filaments capillary; ovary 1-celled with 6 ovules . . . . . *Kandelia.*
Calyx 8-14-cleft; petals 2-cleft, appendaged; filaments filiform; ovary 2-4-celled, with a solitary ovule in each cell . . *Bruguiera.*

× × Embryo immersed in a fleshy albumen. Seeds not germinating before their fall.

Calyx bell-shaped beyond the ovary; ovary-cells 2-ovuled; flowers in cymes . . . . . *Carallia.*

∗ ∗ *Ovary superior or nearly so, with a broad base adnate to the calyx.*

Calyx without bractlets; ovary-cells 4-ovuled . . . . *Gynotroches.*

RHIZOPHORA, L.

Calyx subtended by bractlets united in a cup, 4-parted, valvate. Petals 4, inserted to the base of the fleshy disk, entire. Stamens 8-12; filaments short. Ovary half-inferior, 2-celled, produced in a fleshy cone; style subulate with a 2-toothed stigma; cells with 2 suspended ovules. Fruit coriaceous, surrounded with the calyx-lobes, 1-celled and 1-seeded. Seed pendulous with an elongate radicle protruding from the apex of the capsule while still on the tree. Cotyledons conferruminate. Albumen none.—Saline trees, with very glossy leathery leaves.

Flowers pedicelled; petals along the margins villous . . . *R. mucronata.*
Flowers sessile; petals glabrous . . . . . *R. conjugata.*

1. **R. mucronata,** Lamk.; Bedd. Sylv. Madr. 99, t. 13, f. 4; Brand. For. Fl. 217.—*Pyoo.*—An evergreen tree (15—25+(?)+1—1½), all parts glabrous; leaves oval to elliptically oblong, mucronate by the excurrent midrib, 3-7 in. long, narrowed at the base, rather long-petioled, blunt, coriaceous, very glossy, glabrous; flowers rather large, yellowish, pedicelled, in 2-3-cleft axillary peduncled cymes; petals villous along their inflexed margins; stamens 8; fruit large, about an inch in diameter.

Hab.—Frequent in the tidal, especially the mangrove, forests from Arracan and Pegu down to Tenasserim.—l.—SS.=Sal.

Remarks.—Wood greyish, close-grained, rather heavy. Bark good for tanning.

2. **R. conjugata,** L.; Bedd. Sylv. Madr. 99.—*Pyoo.*—An evergreen tree (15—25+6—10+1—1½), all parts glabrous; leaves oblong to oblong and elliptically-lanceolate, narrowed and usually more acute at the base, convolutely mucronate, 4-8 in. long, rather shortly petioled, coriaceous, very glabrous, glossy; flowers large, by 2-3 sessile on a short thick simple axillary peduncle; petals flat, glabrous; stamens 8-12, usually 11; fruit about ½ an in. thick.

Hab.—Frequent in the littoral, especially the mangrove, forests from Arracan and Pegu down to Tenasserim and the Andamans.—l.—SS.=Sal.

CERIOPS, Arn.

Calyx subtended by bractlets united in a cup, the tube short and at the base adnate to the ovary, the limb 5-6 parted, valvate. Petals 5-6, inserted to the base of the 10-12-lobed fleshy disk, notched, the lobes clavate-bristly. Stamens 10-12, by pairs opposite the petals, the filaments slender. Ovary half-inferior, 3-celled, with 2 pendulous ovules in each cell, produced in a fleshy cone; style short with a simple stigma. Fruit coriaceous, surrounded by the reflexed calyx-lobes, 1-celled and 1-seeded. Seed pendulous, germinating and protruding its elongate-clavate radicle from the top of the fruit while still on the tree; cotyledons conferruminate.—Little, usually pygmæan, trees or rather simple-stemmed shrubs with lucid coriaceous leaves. Flowers small, cymose.

Flowers in very short-peduncled compact cymes; petals setose, ciliate towards the apex . . . . . *C. Roxburghiana.*
Flowers in rather loose cymes; petals terminated by 2 or 3 club-shaped appendages . . . . . *C. Candolleana.*

1. **C. Roxburghiana,** Arn.—*Ka-pyaing.*—An evergreen pygmæan tree or rather simple-stemmed shrub, 2 to 4 ft. high, all parts quite glabrous; leaves obovate or oboval, acute at base, rather long petioled, blunt, coriaceous, glabrous, glossy above; flowers small, greenish, sessile or nearly so, forming a dense capitate cyme on a very short and thick peduncle; petals whitish, concave, setose-ciliate towards the apex; stamens 10-12; fruits small, club-shaped.

Hab.—Frequent in the littoral forests all along the coast from Chittagong down to Tenasserim.—l.—SS.=Sal.

2. **C. Candolleana,** Arn.; Bedd. Sylv. Madr. t. 13, f. 5; Brand. For. Fl. 218.—An evergreen dwarf tree or simple-stemmed shrub, 2 to 5 ft. high, all parts quite glabrous; leaves obovate-oblong, narrowed at the base, blunt or sometimes notched, rather long-petioled, glabrous, glossy above; flowers small, very shortly pedicelled in short but loose cymes; petals obovate with flat margins, somewhat roughish on the outside, terminated by 2 or 3 club-shaped appendages; stamens nearly as long as the petals, glabrous; fruits small, club-shaped.

Hab.—In the mangrove swamps along the shores of the Andamans.—l.—SS.=Sal.

KANDELIA, WA.

Calyx subtended by bractlets united in a cup, the tube short, the limb 5-6-parted, valvate. Petals 5-6, inserted to the base of

the fleshy disk, 2-cleft, the lobes capillary multifid. Stamens numerous, the filaments capillary. Ovary half-inferior, produced in a fleshy cone, 1-celled, with 6 ovules attached by pairs to the middle of the axis; style filiform, with a 3-cleft stigma. Fruit coriaceous, surrounded by the reflexed calyx-lobes, 1-celled and 1-seeded. Seed pendulous, germinating and protruding its elongate-clavate radicle from the apex of the fruit while still on the tree; cotyledons conferruminate.—Little trees or rather shrubs, with coriaceous lucid leaves. Flowers rather large, white.

1. **K. Rheedei,** WA.; Bedd. Sylv. Madr. 100, t. 13, f. 6.—An evergreen little tree or rather simple-stemmed shrub, 3 to 5 ft. high, all parts glabrous; leaves oblong to elliptically oblong, narrowed at the base, blunt, rather shortly petioled, coriaceous, glossy above; flowers rather large, whitish, in poor long-peduncled axillary cymes; fruit conically-ovoid, about an inch long.

HAB.—Frequent in the tidal forests all along the coasts from Chittagong to Pegu.—Fl. May; Fr. June.—l.—SS.=Sal.

BRUGUIERA, Lamk.

Calyx without bractlets, the tube obversely conical or bell-shaped, the limb 8-14-parted, valvate. Petals 8-14, inserted on the margin of the calyx, 2-cleft, bearing 1 or more bristles on the back, at the base convolute and embracing the stamens. Stamens 16-28, by pairs opposite the petals; filaments filiform. Ovary inferior, 2-4-celled, with 2 ovules in each cell; style filiform with a 2-4-cleft stigma. Fruit thick-coriaceous, crowned by the erect or reflexed calyx-lobes, 1-celled and one-seeded. Seed pendulous, germinating and protruding its elongate-clavate radicle from the apex of the fruit while still on the tree; cotyledons short, blunt.—Trees, with glossy coriaceous leaves. Flowers rather large, with a green or purplish calyx.

* *Flowers small; calyx-tube almost club-shaped; the limb 8-cleft; petals* 8.
Calyx-tube tapering at the base, ribbed, the lobes very short and rigid . . . . . *B. parviflora.*
Calyx-tube obtuse at the base, not ribbed, the lobes nearly as long as the tube . . . . . *B. caryophylloides.*
* * *Flowers rather large; calyx-tube almost bell-shaped; the limb* 8-14*-parted; petals* 8-14 . . . *B. gymnorhiza.*

1. **B. parviflora,** WA.; Bedd. Sylv. Madr. 101.—An evergreen small tree or shrub, all parts quite glabrous; leaves oblong to elliptically lanceolate, narrowed at the base, blunt, rather long-petioled, coriaceous, glossy above; flowers small, yellowish green, on slender pedicels, by 3 or more, forming an axillary peduncled cyme of the length of, or longer than, the petioles; calyx-tube

ribbed, the lobes much shorter, rigid; petals shorter than the calyx-lobes, obovate, cucullate-2-lobed, with a bristle between, and 3 or 4 others at the apex of, the lobes, yellowish, puberulous outside; stamens alternately shorter; fruits cylindrically club-shaped, ribbed, crowned with the stiff short calyx-lobes.

Hab.—In the littoral, especially the mangrove, forests of Tenasserim and the Andamans.—l.—SS.=Sal.

2. **B. caryophylloides,** Bl.; Bedd. Sylv. Madr. 101.—An evergreen small tree, all parts quite glabrous; leaves oblong to oblong-lanceolate, narrowed at the base, acute, on a long and slender petiole, coriaceous; flowers small, more or less nodding, on very short and thick pedicels, solitary or by 2-5, forming a short cyme usually of the length of the petiole or shorter; calyx-tube not ribbed, turbinate-club-shaped, rounded at the base, the lobes somewhat shorter than the tube and spreading; petals erect, shorter than the calyx-lobes, oblong, whitish, somewhat puberulous outside, 2-cleft, with a rather long bristle between, and 3 to 5 twisted bristles at the apex of, the lobes; fruits pendulous, somewhat narrowed under the reflexed persistent calyx-lobes, not ribbed.

Hab.—In the mangrove swamps of Upper Tenasserim.—Fl. Feb.; Fr. Apr.—l.—SS.=Sal.

3. **B. gymnorhiza,** Lamk.; Brand. For. Fl. 219; Bedd. Fl. Sylv. Madr. 100 (*Brug. Rheedei,* Bl.; Bedd. Sylv. Madr. 100, t. 14, f. 1).—An evergreen tree (60—80 + 30—40 + 5—8), all parts quite glabrous; leaves oblong to elliptically lanceolate, 3-5 in. long, on a long and thick petiole, shortly and sharply acuminate, coriaceous and glossy; flowers middling-sized, about an inch long, jointed on a short, thick, nodding peduncle, solitary in the axils of the leaves; calyx-limb deeply 10-14-parted, the segments 6-8 lin. long, stiff-linear with 3-angular sharp points, the tube obsoletely 8-14-angular; petals 2-cleft with a bristle between the lobes, either quite glabrous or villous-silky along the margins, the lobes terminated by 1-3 bristles or naked; fruits drooping, oblong, crowned with the stiff calyx-lobes.

Hab.—Common in the littoral, especially the mangrove, forests, especially at estuaries, all along the coasts from Chittagong down to Tenasserim and the Andamans.—Fl. Jan.-May.—l.—SS.=Sal.

Remarks.—Wood reddish brown, the sap-wood lighter coloured, close-grained, coarse-fibrous, very heavy, hard, strong and durable. Bark good for tanning purposes.

CARALLIA, Roxb.

Calyx minutely bracted at the base, shortly 5-8-lobed, valvate. Petals 5-8, inserted round the thin 10-16-lobed disk. Stamens

usually twice as many as petals; filaments short. Ovary inferior, 1- or nearly 3-5-celled, with 2 pendulous ovules in each cell. Fruit small, coriaceous, usually 1-celled and 1-seeded. Seeds reniform-globose. Albumen fleshy.—Trees or shrubs, with glossy, entire, or serrulate leaves. Flowers small, cymose.

Leaves usually entire; petals not embracing the filaments . . *C. lucida.*
Leaves serrulate; petals embracing the filaments . . . . *C. lanceæfolia.*

1. **C. lucida,** Roxb. (*C. integerrima,* DC.; Bedd. Sylv. Madr., t. 193; Brand. For. Fl. 219).—*Manee-aw-ka.*—An evergreen tree (50—80 + 25—50 + 4—10), all parts glabrous; bark about 2 lin. thick, brittle, rough, dark-grey or blackish; cut brown; leaves elliptical or elliptically oblong, acute at the base, on a strong petiole $\frac{1}{4}$-$\frac{1}{2}$ in. long, apiculate or slightly acuminate, entire, coriaceous, 2-6 in. long, glabrous and glossy; flowers white, very small, sessile, in loose or compact short-peduncled axillary cymes; calyx shortly and broadly bell-shaped; petals obovate, concave, coarsely toothed, not embracing the stamens; stamens alternately shorter, the shorter ones opposed to the sepals and bent inwards; style long; berries the size of a pepper-kernel, globose, usually 1-seeded, crowned by the short connivent calyx-teeth.

Hab.—Frequent in the tropical and moister upper mixed forests, entering also the low forests, of Pegu and Martaban, up to 4,000 ft. elevation.—Fl. Dec.-Feb.; Fr. H.S.—s×l.—SS.=Metam. *SiS.* Lat. p.

Remarks.—Wood red-brown, variegated, heavy and close-grained.—□′=60 pd. Used for rice-pounders, planks, etc.; also good for furniture.

2. **C. lanceæfolia,** Roxb.—An evergreen tree, all parts glabrous; leaves elliptical to oblong, regularly crenulate-serrate, almost acuminate, thin coriaceous, shortly petioled; flowers small, white, crowded, almost sessile, in axillary short-peduncled rather lax cymes; petals reniform, truncate at the base and clawed, the blade crenulate and embracing the long inwards-curved filaments; style rather short; berries the size of a pepper-kernel, turbinate-globose, 2-3-seeded.

Hab.—In the tropical forests of Upper Tenasserim.—Fr. H.S.

GYNOTROCHES, Bl.

Calyx without bractlets, the limb 4-5-parted. Petals 4-5, clawed, fimbriate-lacerate. Stamens 8 or 10, inserted under the margins of the 8-10-crenate disk; filaments filiform; anthers didymous. Ovary superior, with a broad base adhering to the calyx, 3-6-celled, with 4 ascending ovules in each cell; style columnar with a 3-6-lobed stigma, the lobes notched and recurved. Berry fleshy, 3-6-celled, many-seeded. Seeds small. Albumen copious.—Little trees, with glossy leaves and deciduous stipules. Flowers small, in axillary clusters or fascicles.

1. **G. axillaris,** Bl.—An evergreen small tree or shrub, all parts glabrous; leaves oblong to elliptical, acuminate, 2-5 in. long, coriaceous, glossy, strongly net-veined; flowers small, yellowish green, pedicelled, almost dioecious by abortion, crowded in the axils of the leaves; calyx about a line long, glabrous; the males with perfect stamens and petals, the ovary usually thin and abortive with the stigma not dilated; the female-hermaphrodites longer pedicelled, the petals and stamens usually smaller or the latter sometimes barren; stigma radiately lobed; berry 1½-2 lin. thick, several-seeded, almost globular.

HAB. Upper Tenasserim.

COMBRETACEÆ.

Flowers hermaphrodite, rarely polygamously dioecious or unisexual. Calyx-tube terete or angular, more or less narrowed above the ovary, the limb usually bell-shaped, 4-5- rarely more-toothed, -lobed or -parted, valvate or very rarely imbricate, persistent or deciduous. Petals none, or as many as calyx-lobes, usually small, imbricate or valvate. Stamens as many or twice as many as calyx-lobes, rarely numerous, in a single or 3 series, inserted on the calyx or epigynous; filaments straight or inflexed in bud, sometimes alternating with glands or staminodes; anthers versatile and opening longitudinally, or adnate and opening in 2 valves. Epigynous disk none or lobed. Ovary inferior, 1-celled, with 2 or more, or very rarely a single, pendulous ovule; style filiform or scarcely any, with an entire terminal stigma. Fruit various, dry or drupaceous, indehiscent or very rarely dehiscing, winged or not. Seed solitary, pendulous. Albumen none; cotyledons convolute or folded, very rarely flat; radicle short, superior.—Trees or shrubs, often climbing, with alternate or opposite, rarely whorled, simple or rarely 3-foliolate leaves. Stipules none. Fowers usually small, in axillary or terminal inflorescences. Bracts usually small; bractlets sometimes larger, often wanting.

Astringent properties prevail in the order, and hence the bark of several species is used for tanning purposes and the fruits for dyeing black. Some of the trees, like *Terminalia,* yield valuable timber, while the kernels of *Terminalia catappa* are eaten like almonds. All the Burmese species are woody, and, therefore, find a place here.

* *Stamens usually without glands or staminodes at base; anthers opening by longitudinal slits. Ovules 2 or more. Flowers in racemes, spikes or heads.*

○ Calyx-limb deciduous.

× Calyx-tube short, more or less constricted but not produced beyond the ovary.

No petals; stamens inflexed in bud; erect trees; flowers in spikes . . . . . *Terminalia.*
Petals very rarely wanting; stamens straight in bud; usually climbers; flowers usually in racemes . . . . . *Combretum.*

× × Calyx-tube long-produced beyond the ovary.

Calyx-tube 2-winged at base; stamens 10, exserted; leaves alternate; flowers in dense heads; trees . . . . *Anogeissus.*
Calyx-tube 5-cornered, very long-produced beyond the ovary; the limb small; stamens straight; leaves opposite; flowers in racemes; scandent shrubs . . . . . *Quisqualis.*

○ ○ Calyx-limb persistent.

Calyx-tube 5-ribbed, not produced beyond the ovary, the limb enlarging after flowering; stamens 10, enclosed; leaves opposite; climbers, with racemose flowers . . . . *Calycopteris.*
Calyx-tube elongated, narrowed above the ovary, the limb not enlarging; stamens 5 or 10, exserted; leaves alternate; flowers in racemes; erect trees . . . . . *Lumnitzera.*

* * *Stamens alternating with as many glands or staminodes; anthers opening by a slit along the inner edge or in 2 valves. Ovules solitary. Flowers in cymes.*

Calyx-lobes valvate, deciduous; fruit laterally 2- or 4-winged; climbers with 3-foliolate leaves . . . . . *Illigera.*
Calyx-lobes imbricate, 2 of them persistent and enlarging into long terminal wings; erect tree with simple or lobed leaves . *Gyrocarpus.*

TERMINALIA, L.

Flowers hermaphrodite or polygamously dioecious. Calyx-tube not produced beyond the ovary, the limb bell-shaped or urceolate, 5-cleft, deciduous. Petals none. Stamens in 2 series; filaments filiform or subulate, inflexed in bud; anthers didymous. Ovary 1-celled, with 2 or rarely 3 suspended ovules; style subulate with a simple stigma. Fruit angular, compressed or winged, sometimes samaroid, dry or fleshy, the putamen coriaceous or bony. Seed pendulous, the testa membranous. Cotyledons convolute.—Trees or erect shrubs, with alternate or rarely opposite or whorled leaves often glandular at the base. Flowers small, usually offensively smelling, in axillary spikes.

* *Fruit a fleshy drupe, with a long compressed or obsoletely angular putamen.*

Young shoots rusty pubescent; leaves cuneate obovate, very shortly petioled; spikes all simple, glabrous; drupes compressed . *T. catappa.*
As former, but drupes obsoletely 5-angular, red within . . *T. procera.*
Buds rusty villous; leaves obovate, on 2-3 in. long petioles; spikes all simple, puberulous; drupes obovate, usually silky pubescent . . . . . *T. Belerica.*
Young shoots and under-side of the short-petioled oblong leaves rusty villous; spikes simple or panicled, tomentose or puberulous; drupes oval, glabrous; calyx-tube villous . . . *T. chebula.*
As former, but calyx-tube quite glabrous, the flowers and fruits much smaller . . . . . *T. tomentella.*
Very young shoots rusty-villous; leaves quite glabrous, shortly petioled, acuminate; spikes tomentose or puberulous, collected in terminal panicles; drupes oblong-lanceolate, obsoletely 5-cornered . . . . . *T. citrina.*

* * *Fruit a dry nut with a chartaceous or fibrous-coriaceous pericarp, samaroid or 3-5-cornered with as many or fewer equal or unequal wings.*

× Nuts usually 3-cornered, the angles extended into 2 equal, or 1 or 3 unequal wings.

○ Spikes simple, axillary.

All parts glabrous; leaves obovate; petiole 2-3 in. long; nut 2-winged, about 3-3½ in. across, brown-velvety . . . *T. bialata.*

As former, but leaves smaller and shorter petioled; nuts 2-winged, only ½-¾ in. across . . . . . *T. pyrifolia.*

○ ○ Spikes collected in a terminal panicle.

Young shoots and inflorescence tawny pubescent; nuts almost glabrous, equally 2-winged, only about 4-5 lin. broad . . . *T. myriocarpa.*

× × Nuts 4- or 5- cornered, all angles equally produced into wings.

All parts more or less greyish tomentose; leaves shortly petioled, with 2 stalked turbinate basilar glands, strongly net-veined beneath . . . . . *T. alata.*

All parts glabrous; leaves shortly petioled, with 2 stalked turbinate glands, prominently net-veined beneath; the panicled spikes and the calyces puberulous or almost tomentose . *T. crenulata.*

As former, but the panicled spikes and calyces outside quite glabrous . . . . . *T. macrocarpa.*

* *Fruit a fleshy drupe, with a compressed or slightly angular putamen.*

1. **T. catappa,** L.; Bedd. Sylv. Madr. t. 20.—A tree (60—70 + 30—35 + 6—8), shedding leaves in H.S., the branches whorled and spreading, the young shoots brown-pubescent; bark smooth; leaves crowded at the end of the branchlets, on a very short thick petiole, from obovate to obovate-oblong, rounded or tapering at the cuneate base and furnished with a gland on each side, apiculate, ½-1 ft. long, chartaceous, glabrous; flowers small, whitish, subtended by a small lanceolate bractlet, the males numerous, with a few hermaphrodites towards the base, forming solitary, simple, and rather slender glabrous spikes in the axils of the leaves and shorter than them; calyx glabrous, the tube in the hermaphrodite flowers rather elongate and contracted above the ovary, villous inside, the lobes glabrous; drupes oblong to oval, somewhat compressed, smooth, yellowish, about 1-1½ in. long.

Var. 1. **Catappa,** leaves rounded at the base; stamens all spreading; drupes larger, slightly compressed, with somewhat prominent edges, the mesocarp whitish or yellowish.

Var. 2. **pubescens,** leaves more or less pubescent beneath.

Hab.—Frequent in the beach forests of the Andamans; much cultivated in villages all over Burma.—Fl. Apr.-May; Fr. June-July—s×l. SS.=SiS.

Remarks.—Wood brown, waved, rather heavy, rather close-grained; takes a fine polish.

2. **T. procera,** Roxb.—A lofty tree (80—120 + 50—90 + 7—10) apparently shedding leaves in H.S., the leaf-buds appressed

pubescent; leaves obversely lanceolate to obovate-oblong, usually unequal at the acute base, on a rather slender petiole $\frac{1}{3}$-$\frac{3}{4}$ in. long, 5-8 in. long, coriaceous, glabrous, acute or apiculate; flowers small, white, almost sessile, forming glabrous axillary racemes, the hermaphrodite ones situated near the base; calyx-limb salver-shaped; petals ovate-lanceolate, acute; stamens alternately shorter and incurved; drupes ellipsoid-oblong, obsoletely 5-cornered, glabrous, about an inch long or somewhat longer, yellow, the mesocarp pulpy, red, somewhat acid, the nut conform with the drupe, 5-angular and not in the least compressed.

Hab.—Not unfrequent in the tropical forests of the Andamans.—Fr. R.S.

3. **T. Belerica,** Roxb.; Bedd. Sylv. Mad. t. 19; Brand. For. Fl. 222.—*Thitsein.*—A leaf-shedding tree (70—80 + 30—40 + 6—8), all parts glabrous, the leaf-buds rusty pubescent; bark thick, brittle, longitudinally fissured and cracked, blackish; cut yellow; leaves crowded at the end of the branchlets, obovate to obovate-oblong, on a glandless or 2-glandular slender petiole 2-3 in. long, often somewhat unequal at the base, apiculate, entire, membranous, 5-7 in. long, glabrous; flowers small, dull greyish yellow, sessile, in axillary, solitary, simple, puberulous spikes, the males towards the apex of the spike, the females below; calyx shortly rusty pubescent outside, densely rusty villous at the base inside, the tube oblong, pubescent; drupes obovate, nearly as large as a plum, corky-fleshy, usually silky puberulous.

Hab.—Frequent in the mixed forests, especially the upper ones, all over Pegu down to Upper Tenasserim, rather rare in Prome and Ava, up to 2,000 ft. elevation.—Fl. Apr.-May; Fr. C.S.—l.—SS. = Metam. *SiS.*

Remarks.—Wood rather soft, white, tolerably durable. □′ = 40 pd. Good for packing-boxes. Exudes a gum.

4. **T. tomentella,** Kz.—*Hpangah.*—A tree (80—100 + 50—80 + 9—12), shedding leaves in H.S., the young parts all covered with a copper-coloured appressed villous pubescence; bark dark or blackish grey, longitudinally deeply cracked, peeling off in thick brittle pieces; leaves ovate to ovate-oblong, unequally decurrent at the base, on a 8-12 lin. long petiole 2-glandular towards the apex, 5-8 in. long, acute or nearly so, coriaceous, entire, while young densely, afterwards slightly, coppery-pubescent beneath or altogether glabrescent; flowers small, sessile, yellowish, in spikes, forming shortly tomentose, rusty or tawny coloured small panicles; bractlets subulate, longer than the flowers, deciduous; calyx quite glabrous outside, the lobes triangular, acute, along with the hypogynous glands densely white-woolly inside, the tube ovate, terete, glabrous; drupes hardly an inch long, oval, obsoletely 5-gonous or terete, greenish yellow, smooth.

Hab.—Common in the upper mixed forests and low forests all over Pegu and Martaban down to Tenasserim, up to 2,000 ft. elevation.—Fl. June ; Fr. C.S.—l.—SS. = Metam. *SiS.* Arg.

Remarks.—Wood pale-brown, rather heavy, close-grained, the heart-wood yellowish brown. Used for yokes and canoes. Fruit mixed with iron-clay gives an ink of an inferior kind.

5. **T. chebula,** Retz. ; Bedd. Sylv. Madr. t. 27 ; Brand. For. Fl. 223, t. 29.—A tree (60—70 + 25—35 + 8—10), shedding leaves in H.S., the younger parts rusty villous ; leaves opposite or nearly so, oblong, on a 1½-2 in. long petiole usually 2-glanded below the apex, shortly and bluntish acuminate or apiculate, with or without 2 small glands on the margin near the base, entire, almost coriaceous, 6-8 in. long, while young covered with a dense rusty-coloured tomentum, when full-grown glabrous above, or altogether glabrescent ; flowers small, dull-white, all hermaphrodite, subtended by a subulate downy bractlet ; calyx very villous all over, especially inside, the tube oval or oblong-oval, angular ; hypogynous glands 5, very villous ; drupes oval, about 1-1½ in. long, obsoletely 5-angular, smooth, greenish yellow, the mesocarp hard, yellowish.

Hab.—Chittagong.

Remarks.—Sap-wood greyish, streaked, tolerably close-grained ; the heart-wood hard, yellowish or dark-brown to blackish, heavy ; takes a fine polish. Good for furniture. Nuts used with iron-clay for a good sort of ink ; they also give with alum a durable yellow dye.

6. **T. citrina,** Roxb.—A tree (60—80 + 15—30 + 5—8), shedding leaves in H.S., all parts glabrous, the very young shoots rusty villous ; leaves almost opposite, from broadly lanceolate to oblong, on a ½-1 in. long petiole 2-glanded at the apex, usually with a few glands along the margin towards the base, shortly acuminate, entire, chartaceous, when very young rusty villous, soon quite glabrous, and, in a dried state, of a peculiar metallic or silky lustre, 4-6 in. long ; flowers small, dull-yellow, sessile, all hermaphrodite, subtended by a deciduous linear bractlet, forming spikes collected in a terminal slightly rusty villous or puberulous panicle ; calyx glabrous outside, pubescent inside, the tube linear-oblong ; hypogynous glands 5, rusty-woolly ; drupe oblong-lanceolate, about 2 in. long, obsoletely, when dry manifestly, 5-cornered, dull orange-yellow, smooth.

Hab.—Tenasserim.

* * *Fruit a dry nut with a chartaceous or fibrous-coriaceous pericarp, samaroid, or* 3-5*-cornered, with as many or fewer equal or unequal wings.*

7. **T. bialata,** Wall.—*Lein-pen.*—A tree (80—100 + 40—60 + 6—10), leafless in H.S., all parts glabrous, the leaf-buds rusty

puberulous; leaves crowded at the end of the branchlets, obovate, on a slender glandless petiole 1½-2 in. long, unequally acuminate at the base, abruptly acuminate or apiculate, 4-6 in. long, chartaceous, glabrous; flowers small, greenish yellow, supported by a minute deciduous bract, forming simple puberulous axillary spikes usually as long as the leaves, the male flowers at the upper, the female ones at the lower part of the spike; calyx rusty pubescent, very densely rusty villous inside at the base, the tube 3-gonous; nut oblong, 1½-2 in. long, more or less brown-velvety, equally tapering at both ends, 3-gonous, the 2 lateral angles expanded into 2 chartaceous striate-waved and velvety-wings about 1-1½ in. broad.

Hab.—Not uncommon in the upper mixed forests of the Andamans.—Fr. C.S.—l.—SS. = SiS.

8. **T. pyrifolia,** Kz.—*Lein-pen.*—A tree (60—80+30—50+5—8), shedding leaves in H.S., all parts glabrous or the leaf-buds greyish puberulous; leaves crowded at the end of the branchlets, oblong to broadly lanceolate, on a glandless slender petiole ¾-1½ in. long, acuminate at the base, shortly acuminate, 2-4 in. long, coriaceous, glabrous; flowers greenish yellow, small, forming a tawny puberulous spike in the axils of the leaves and usually longer than them; calyx densely tawny or brown-pubescent, and similarly but more densely villous inside, the tube ½ a line long, obsoletely 3-cornered; fruits only ½-¾ in. long, 3-cornered, indistinctly brown-velvety, the 2 lateral angles expanded into 2 rounded striate chartaceous wings of about ½-¾ in. breadth.

Hab.—Frequent in the mixed forests, especially the upper and lower ones, from Pegu and Martaban down to Upper Tenasserim; rare in Prome.—Fl. H.S.; Fr. C.S.—l.—SS. = Metam. *SiS.*

Remarks.—Wood not used; □′ = 39 pd.

9. **T. myriocarpa,** Heurck & Muell-Arg.—An evergreen large tree, the young parts rusty pubescent; leaves opposite and more or less alternate, oblong, rounded at the base, on a thick 2-3 lin. long petiole usually conspicuously 1-glanded at apex, ⅓-1 ft. long, rigidly chartaceous, glabrous, the lateral nerves beneath strongly prominent; flowers small, subtended by a minute glabrous bract, in tawny-velvety spikes arranged in an ample terminal leafy panicle; floral leaves lanceolate, 1-2 in. long, at base furnished with 1 or 2 large conspicuous glands; calyx, especially the flask-shaped tube, tawny pubescent, long-hirsute inside; fruits crowded and almost imbricate, the nut only 1½-2 lin. long, 3-gonously lanceolate, indistinctly puberulous, 2 of the angles expanded into as many obliquely truncate or unequally 2-lobed oblong 2-3 lin. broad

yellowish or brownish almost glabrous wings, the third angle not winged or produced into a very small short linear wing.

HAB.—Ava, Khakyen hills east of Bhamo.—Fl. R.S. ; Fr. Jan.-March.

REMARKS.—Timber said to be excellent.

10. **T. alata,** Roth. (*T. tomentosa,* Roxb. ; Bedd. Sylv. Madr. t. 17 ; Brand. For. Fl. 225).—*Htoukyan.*—A tree (40—60+10—25 +3—6), shedding leaves in H.S., all softer parts greyish pubescent ; leaves from ovate-oblong to oblong, on a thick glandless petiole ½-1 in. long, unequal at the base, almost blunt, 6-12 in. long, rather coriaceous, entire, rather glabrous and somewhat wrinkled above, beneath net-veined and more or less densely greyish pubescent, bearing 1 or 2 large turbinate somewhat stalked glands along the midrib far above the base ; flowers small, greenish, subtended by a small tomentose lanceolate bract, forming tomentose, solitary, axillary spikes often collected into axillary and terminal panicles ; calyx rusty pubescent, densely rusty villous inside at the bottom, the tube short ; fruits dry, glabrous or downy, from 1½ to nearly 2 in. long and broad, 5-winged, the wings semi-oblong, broader than the diameter of the nut.

HAB.—Common in the mixed forests, especially the lower ones, of Prome, Pegu, and Martaban.—Fl. H.S. ; Fr. C.S.—I.—SS. = Lat. *Arg. All.* SiS.

REMARKS.—Wood very heavy, the sap-wood pale-brown, the heart-wood dark-brown, fibrous, but close-grained ; takes very fine polish.

11. **T. crenulata,** Roth. (*T. arjuna,* Bedd. Sylv. Madr. t. 28 ; Brand. Sylv. Madr. 224).—*Htoukyan.*—A tree (60—100+30—70 +6—12), shedding leaves in H.S., all parts glabrous; bark thick, brittle, dark-grey, deeply longitudinally cracked ; cut red ; leaves from elliptically and ovate-oblong to oblong, on a strong glandless petiole ⅓-⅔ in. long, furnished with 2 almost stalked large turbinate glands along the midrib above the usually unequal base, almost entire or more usually obsoletely crenate-toothed, acute or almost blunt, rather coriaceous, from 4-10 in. long, glabrous, above usually wrinkled, beneath smooth and in a dried state brown ; flowers small, greenish, subtended by a linear-lanceolate short bract, in glabrous or puberulous, rarely pubescent spikes in the axils of the lower leaves or collected into terminal and axillary panicles ; calyx outside glabrous or pubescent, the tube oblong, densely villous within ; fruits dry, very variable in size, glabrous, from 1½-2½ in. long and broad, 5- but often only 4-winged, the wings semi-oblong, broader than the diameter of the nut.

Var. 1. **Roxburghii** (*T. glabra,* WA.) : bark smooth ; spikes and panicles puberulous or pubescent ; calyx pubescent all over, or the limb outside glabrous or nearly so ; fruits usually only 1-1½ in. across.

Var. 2. **macrocarpa** (*Pentaptera macrocarpa*, Wall.): bark rough and fissured; inflorescence and the whole calyx (except the dense rusty villosity at the bottom inside) glabrous; fruits usually (but not always) 2½ in. across.

Hab. Var. 1: frequent in the mixed forests of the Pegu Yomah and elsewhere; var. 2: common in all leaf-shedding forests from Chittagong, Prome, and Martaban down to Tenasserim, up to 2,000 ft. elevation.—Fl. H.S.; Fr. C.S.—l.—SS.=∞*SiS*.

Remarks.—Heart-wood dark-brown. □'=58 pd. Used for house-posts and planking.

COMBRETUM, L.

Flowers polygamously dioecious. Calyx-tube constricted above the ovary, the limb bell-shaped, 4- or 5-cleft, deciduous. Petals 4 or 5 (very rarely wanting), small, inserted between the calyx-lobes. Stamens 8 or 10, in 2 series, the filaments elongated, straight in bud; anthers didymous. Ovary 1-celled, with 2 to 6 suspended ovules; style subulate with simple stigma. Fruit coriaceous or almost spongy, 4- to 6-cornered or 4-6-winged, 1-seeded. Seeds elongate, the cotyledons various.—Shrubs, usually climber, rarely trees, with opposite or whorled, very rarely alternate, leaves. Flowers in spikes or racemes often collected into panicles. Bracts small or rather conspicuous.

* *Flowers* 5-*merous*. *Stamens* 10, *all equal or alternately shorter*. *Fruits usually* 5- *rarely* 4- *or* 6-8-*cornered or -winged*.

× Calyx-limb abruptly cup-shaped.

○ No petals.

Leaves only 1½-3 in. long; inflorescence greyish velvety; the floral leaves not discoloured . . . . . *C. apetalum*.

○ ○ Petals present.

Leaves large, opposite; inflorescence rusty or tawny-tomentose, the floral leaves discoloured and white; fruits chartaceously 5-winged . . . . . *C. decandrum*.

Leaves often whorled by 2-4, smooth, coriaceous; inflorescence greyish tomentose, without floral leaves; fruits with 5 sharp, thick, almost wing-like angles . . . . . *C. trifoliolatum*.

Similar to former, but leaves rigid, strongly nerved and net-veined; fruits sharply 4-cornered . . . . . *C. tetragonocarpum*.

× × Calyx-limb bell-shaped, gradually narrowed into the tube.

Inflorescence, petioles, and branchlets all greyish or rusty puberulous or velvety . . . . . *C. ovale*.

Inflorescence, petioles, and branchlets all rusty pilose; fruits 5-winged, puberulous . . . . . *C. pilosum*.

* * *Flowers* 4-*merous*. *Stamens* 8, *equal or alternately shorter*. *Fruits usually* 4- (*rarely* 5-) *winged or cornered*.

× Calyx-limb bell-shaped, gradually tapering in the longer or shorter tube. Fruits winged, the wings chartaceous and broader than the diameter of the nut.

○ Flowers shortly pedicelled.

All parts glabrous; inflorescence and flowers velvety . . . . *C. extensum.*

○ ○ Flowers all sessile.

All younger parts and inflorescence coppery or rusty-lepidote; leaves large, opposite . . . . . *C. squamosum.*

Leaves, at least on the older branchlets, usually whorled by 3, glabrous, while young minutely lepidote; inflorescence and shoots puberulous . . . . . *C. Chinense.*

As former, but branchlets, petioles, and inflorescence all rusty tomentose; leaves more or less pubescent beneath, never scaly *C. dasystachyum.*

× × Calyx-limb abruptly cup-shaped, the tube funnel-shaped. Fruits winged or angular.

† Fruits 4- or 5-winged, the wings chartaceous; leaves and fruits small.

× Body of fruit smooth.

Young shoots rusty pubescent; branchlets terete; leaves and the 4- or 5-winged fruits glabrous . . . . . *C. pyrifolium.*

All parts, also the 4-winged fruits, more or less silvery lepidote; branchlets 4-cornered . . . . . *C. quadrangulare.*

× × Body of fruit fibrillose . . . . *C. Wallichii.*

† † Fruits 4-cornered, the angles thick and rounded.

Inflorescence and young branchlets rusty puberous, the former at the same time lepidote; leaves large, strongly nerved and parallel-veined . . . . . *C. costatum.*

∗ *Flowers* 5-*merous*. *Stamens* 10.

1. **C. apetalum,** Wall.—*Naboo-nway.*—A weak tree (15—25 + (?) + 1—1½), often half-scandent, shedding leaves in H.S., the young shoots downy; leaves small, on a 2-3 lin. long slender petiole, ovate-oblong, acuminate, entire, chartaceous, 1½-3 in. long, glossy and glabrous, the nerves beneath puberulous, the under-surface usually with a metallic hue; flowers very numerous, small, apetalous, each supported by a minute subulate puberulous very deciduous bract, racemose, the racemes puberulous, rarely simple and axillary, but usually forming brachiate panicles in the axils of the upper leaves or at the ends of the branches, usually furnished with small elliptical floral leaves at the lower forkings; calyx velvety outside, pubescent within, the limb abruptly cup-shaped, 5-lobed, the lobes reflexed and linear-acuminate; tube oblong, terete or nearly so, shortly and densely pubescent; fruits about ½-¾ in. long, 5-winged, the wings chartaceous, striate, puberulous at the base.

Hab.—Common in the dry forests, especially the mixed ones, of Prome; also Ava.—Fl. Sept.-Jan.; Fr. March.—l.—SS.=CaS.

2. **C. decandrum,** Roxb.; Brand. For. Fl. 220.—*Thama-ka-nway.*—An evergreen large scandent shrub, the branchlets and young shoots rusty pubescent; bark smooth, greyish brown; leaves oblong to oblong-lanceolate, on a rusty-pubescent petiole 2-3 lin. long, cuspidate-acuminate, entire, chartaceous, 4-6 in. long, glabrous or usually the nerves beneath appressed rusty puberulous; flowers small, whitish, subtended by a long subulate-linear pubescent bract, in rather short spikes, each supported by a discoloured white or pale-green, 1-1½ in. long, membranous, glabrous or pubescent

floral leaf, the whole forming a densely rusty-pubescent panicle at the end of the branches or in the axils of the leaves; calyx densely rusty pubescent, 5-lobed, the tube elliptically oblong, 5-furrowed; petals 5, obovate-oblong, like the stamens twice as long as the calyx-lobes; fruits oblong, about an inch long, glabrous, shortly 5-winged, the wings about as broad as the diameter of the nut, chartaceous.

Hab.—Common all over Burma and the adjoining provinces, in all kinds of forests, especially the evergreen ones, up to 3,000 ft. elevation.—Fl. Nov.—Feb.—l × s.—SS.=∞.

Remarks.—Wood rather light, fibrous, but close-grained, pale-coloured, soft.

3. **C. trifoliatum,** Vent.—An evergreen large scrambling or scandent shrub, all parts glabrous or the young shoots puberulous; leaves opposite or often whorled by 3 or rarely by 4, from elliptically and obovate-oblong to oblong-lanceolate, usually acute or blunt with a mucro, on a glabrous or fugaceously pubescent petiole 1-2 lin. long, entire and usually waved, coriaceous, usually 3-4 in. long, sometimes much larger, glossy above, beneath smooth or rarely fugaceously pubescent along the midrib, with or without a tuft of hairs in the axils of the principal nerves; flowers small, whitish, subtended by a subulate appressed pubescent bract, forming densely tomentose or puberulous spikes arranged in simple or brachiate panicles at the end of the branchlets or in the axils of the leaves; calyx appressed greyish pubescent, densely hirsute inside, the limb shortly cup-shaped, 5-toothed, with the teeth lanceolate-subulate; petals longer than the calyx-teeth, elliptically lanceolate, fringed and appressed pubescent outside; fruits elliptically oblong, 1-1½ in. long, glabrous, sharply 5-angular, the angles almost wing-like produced, firmly coriaceous and much narrower than the diameter of the nut.

Hab.—Frequent in the swamp forests and along inundated banks of choungs all over Burma from Ava and Martaban down to Tenasserim.—Fl. Jan.-March; Fr. Apr.-June.—l.—SS.=All.

4. **C. tetragonocarpum,** Kz.—An evergreen large scandent shrub, all parts glabrous; leaves oblong to elliptically oblong, on a thick about a line long petiole, blunt or almost retuse, 3-5 in. long, coriaceous, conspicuously nerved and net-veined on both sides, glabrous; flowers small, whitish, subtended by a small subulate villous bract, forming robust, tawny villous, solitary spikes in the axils of the leaves and shorter than, or as long as, them, or collected in axillary and terminal poor brachiate panicles; calyx-tube shortly rusty villous, short, oval, the limb cup-shaped, hairy and lepidote outside, densely rusty villous inside, 4-toothed, with the teeth short and acute; petals minute; fruits an inch long or somewhat longer,

glabrous, pale-brown, elliptically ovate, 4-cornered, the angles thick coriaceous, sharp and almost wing-like prominent, much narrower than the diameter of the nut.

HAB.—Frequent in the swamp forests of the alluvial plains of Pegu.—Fl. Febr.-March ; Fr. May.—l.—SS.=All.

5. **C. ovale,** R. Br.—*Kyet-tet-nway.*—A leaf-shedding spreading shrub, or, in shady forests, a large climber with arm-thick stems, the young shoots and branchlets densely rusty puberulous ; leaves variable not only in size, but also in shape, from oval and elliptical to oblong-lanceolate, on a short and rather slender puberulous petiole, acuminate, acute or blunt, entire, chartaceous, 1½-2 or often 3-4 in. long, glabrous, or beneath slightly and minutely appressed pubescent on the nerves ; flowers middling-sized, pale rose-coloured, on very short appressed tawny-pubescent pedicels, subtended by an ovate-lanceolate, acute or acuminate, pubescent bract of 3-4 lin. length or larger, forming a tawny tomentose or densely puberulous bracted short opposite simple raceme on a very short peduncle or almost sessile and arising from above the scars of the fallen leaves and terminal ; calyx bell-shaped-tubular, appressed tawny pubescent, 5-lobed ; petals 5, obovate-lanceolate, nearly 3-4 lin. long, rather blunt, sparingly pubescent outside ; stamens 10, long-exserted, with blue (?) anthers ; fruits unknown.

HAB.—Rather frequent in the tropical and mixed forests of Pegu and Martaban, also in shrubberies and open forests, but rare.—Fl. March-May.—s : l & l.—SS.=petrophilous.

6. **C. pilosum,** Roxb.—A large woody climber, the branchlets and young shoots densely covered with rusty-coloured soft spreading hairs ; bark pretty smooth, dark-brown ; leaves from elliptically to oblong- or ovate-lanceolate, on a very short thick rusty-pilose petiole or sometimes almost sessile, acuminate, entire, chartaceous, 5-7 in. long, glabrous, sometimes fringed, the midrib and nerves beneath sprinkled with soft rusty hairs ; flowers middling-sized, whitish, on short, rusty-pubescent pedicels and subtended by a linear-lanceolate, acuminate, appressed pubescent bract of 3-4 lin. length, forming brachiate short racemes usually supported by small, but rather broad, acuminate, more or less discoloured floral leaves, and collected into usually dense and rather short densely rusty-pilose or hirsute panicles at the end of the branches or in the axils of the leaves ; calyx 3 to nearly 4 lin. long, densely appressed rusty pubescent, bell-shaped, 5-lobed ; petals linear-oblong, blunt, about 2 lin. long, appressed tawny pubescent outside, white ; stamens long-exserted, the anthers yellow ; fruits about an inch long, ovate-oblong, puberulous, 5-winged, the wings chartaceous, broader than the diameter of the nut.

Hab.—Pegu, above Rangoon (Cleghorn); Tenasserim, from Moulmein down to Mergui.—Fl. January.

* * *Flowers* 4-*merous*. *Stamens* 8.

7. **C. extensum,** Roxb.—*Moung-ma-ka-nway.*—A large woody climber, all parts glabrous; leaves from broadly oblong to ovate-oblong and almost orbicular, on ½ an in. long petiole, acute, apiculate or shortly cuspidate, entire, chartaceous, 3-4 or usually 4-8 in. long, glabrous, usually pale-coloured beneath; flowers small, whitish, subtended by a very minute deciduous bract, forming either simple or forked short or elongate velvety spikes often collected in a panicle in the axils of the leaves or at the end of the branchlets; calyx nearly 3-4 lin. long, tubular-bell-shaped, velvety, the limb 4-lobed, densely tawny hispid at the throat; petals obovate, minute, shorter than the linear-lanceolate acuminate calyx-lobes; stamens long-exserted, the anthers yellow or orange; fruits about 1⅓ in. long, broadly oblong, glabrous, 4-winged, the wings semi-oblong, chartaceous, broader than the diameter of the nut.

Hab.—Common in all leaf-shedding forests, especially the mixed ones, all over Burma and adjacent provinces down to Tenasserim.—Fl. Jan.-March; Fr. May.—l.—SS. = ∞.

8. **C. squamosum,** Roxb.—A leaf-shedding, lofty, scandent shrub, with tortuous buttressed stems as thick as a man's thigh, all softer parts covered with minute rusty scales; bark about ½ an in. thick, corky and lenticellate, dark-brown; cut brown; leaves opposite, from broadly ovate-oblong to oblong-lanceolate, on a 3-4 lin. long lepidote petiole, apiculate, entire, almost coriaceous, 5-6 in. long or sometimes much smaller, above sparingly lepidote-dotted, beneath, especially while young, rusty or pale lepidote and dotted; flowers small, white, subtended by a subulate lepidote bract, in coppery lepidote spikes usually each supported by a small densely coppery-lepidote floral leaf, not only solitary, but more generally in panicles in the axils of the leaves and often collected into a compound larger one at the end of the branches; calyx densely coppery-lepidote, the tube 4-cornered, the limb cupular-bell-shaped, densely rusty-hirsute at the throat, 4-toothed; petals 4, obovate-lanceolate, acute, longer than the calyx-teeth; fruits broadly oblong, glabrous, nearly 1½ in. long, 4-winged, the wings chartaceous, semi-oblong, broader than the diameter of the nut.

Hab.—Frequent in the open, especially the low, but also the mixed, forests of Pegu and Martaban as far down as Tenasserim.—Fl. March-Apr.; Fr. C.S. and May-June —l.—SS. = Dil. SiS.

Remarks.—Wood rather light, coarse, fibrous, and porose, pale-brown.

9. **C. Chinense,** Roxb., hardly of Don.—An evergreen large woody climber with dark-brown and rather smooth branches, the

young shoots and branchlets minutely lepidote ; leaves crowded by 3-4 and usually whorled, from obovate-oblong to oblong and oblong-lanceolate, on a short but slender minutely lepidote petiole, apiculate, blunt, or sometimes almost retuse, entire, 3-5 in. long, almost coriaceous, above sprinkled with minute scales, glabrous beneath ; flowers small, white, supported by a subulate minutely scaly recurved bract, forming simple, solitary, minutely rusty lepidote spikes in the axils of the leaves, or by suppression of the leaves the spikes sometimes appearing panicled ; calyx tubular-bell-shaped, minutely and densely rusty-lepidote, the limb 4-lobed, inside at the throat much rusty-hirsute ; petals obovate, twice as long as the calyx-lobes ; fruit about 1½ in. long and nearly as broad, broadly oblong, glabrous, 4-winged, the chartaceous wings retuse at both ends, broader than the diameter of the nut.

Hab.—Not uncommon in the tropical forests of Martaban east of Tounghoo, up to 3,000 ft. elevation ; Chittagong.—Fr. March-Apr.—s : l.—SS.=Metam.

10. **C. dasystachyum,** Kz.—An evergreen large woody climber, much resembling the former species, but all parts more or less pubescent ; leaves opposite or more usually by threes, from elliptically to obovate-oblong, on a very short thick tawny- or rusty-pubescent petiole, acuminate, entire, 3-4 in. long, membranous, above sprinkled with minute white dots, beneath (along the nerves densely) pubescent ; flowers small, whitish, sessile (in Burmese specimens apparently bractless), forming rather robust, straight, spreading or decurved, densely rusty tomentose spikes in the axils of the leaves and much shorter than them ; calyx tubular-bell-shaped, the limb 4-lobed, densely tawny hispid inside ; petals broadly oblong, cuneately narrowed in a claw, longer than the calyx-lobes ; ovary soon glabrous, obsoletely 4-cornered ; fruits oblong, nearly 1½ in. long, about an inch broad, glabrous, 4-winged, the wings chartaceous, semi-oblong, much broader than the diameter of the nut.

Hab.—Rather frequent in the tropical forests of the eastern slopes of the Pegu Yomah and in Martaban east of Tounghoo, especially along choungs.—Fl. March-Apr.—s.—SS.=Metam. SiS.

11. **C. pyrifolium,** Kz.—A scandent shrub (?) resembling *C. ovalifolium,* Roxb., the young shoots shortly rusty pubescent ; leaves small, from oval and broadly oblong to almost orbicular, opposite and alternate, on a slender petiole 3 to 4 lin. long, blunt or almost retuse and mucronate, entire, chartaceous, 1½-2 in. long, glabrous and minutely dotted above ; flowers ... ; spikes puberulous, solitary, or in slender, axillary and terminal short panicles ; fruits rather small, ½-¾ in. long, glabrous, 5- and 4-winged, the wings chartaceous, semi-oval, broader than the diameter of the nut.

Hab.—Ava.—Fr. Sept.-Nov.

12. **C. quadrangulare,** Kz.—A somewhat scandent shrub, all softer parts more or less covered with silvery scales and dotted, the branchlets sharply 4-cornered; leaves opposite or rarely alternate, small, obovate-cuneate or rarely ovate, on a short but slender lepidote petiole, usually blunt or almost retuse and mucronate, entire, 1½-3 in. long, chartaceous, on both sides (beneath rather densely) covered with silvery orbicular scales, and dotted; flowers small, white (?), supported by a subulate very fugaceous bract, forming simple, densely lepidote, solitary or paired spikes in the axils of the leaves and shorter than them; calyx funnel-shaped, hardly a line long, densely lepidote, the limb 4-toothed, densely tawny villous inside; petals somewhat longer than the 3-angular calyx-teeth, obovate; stamens exserted; fruits small, ½-⅔ in. long and broad, almost orbicular, appearing whitish from numerous silvery scales, 4-winged, the wings chartaceous, broader than the diameter of the nut.

Hab.—Tenasserim.—Fl. Apr.-May.

13. **C. costatum,** Roxb.—A large woody climber, the young shoots rusty powdery and usually minutely scaly; leaves opposite or nearly so, oblong to elliptically oblong, on a 3-5 lin. long strong petiole, bluntish cuspidate or acuminate, entire, chartaceous, 6-9 in. long, glabrous, beneath along the prominent nerves more or less puberulous, but soon glabrescent, strongly transversely parallel-veined; flowers small, yellowish, supported by a thick, linear, short bract, in minutely scaly spikes usually arising on separate axillary leafy shoots and forming some sort of a leafy axillary panicle; calyx minutely scaly, cupular-funnel-shaped, 4-toothed, the teeth short and broad, acute; tube oblong, bluntish, 4-cornered, the limb glabrous inside; petals minute, yellow, lanceolate, acute; fruits linear-oblong, from 1½-1¾ in. long, glabrous, 4-angled, the angles thickened, solid and blunt, sharp and narrowed towards their upper end, about as broad as the diameter of the nut or narrower.

Hab.—Tenasserim.—Fr. Apr.-May.

14. **C. Wallichii,** DC.—A large scandent shrub, the young shoots rusty puberulous; leaves elliptical to elliptically oval, on a strong short petiole, rounded or obtuse at the base, shortly and rather abruptly acuminate or apiculate, 4-6 in. long, chartaceous, puberulous beneath and glabrescent; flowers small, rusty puberulous, supported by linear-subulate bracts longer than the tube and forming axillary solitary rusty-pubescent racemes shorter than the leaves and often collected into terminal panicles; calyx lepidote and obscurely rusty puberulous outside, the limb angular, 4-toothed, densely brown-hispid inside; petals small, obovate-cuneate, glabrous; fruits dry-chartaceous, rotundate in outline,

4-winged, the wings striate, pale-brown, nearly doubly broader than the fibrillose-clothed nut.

Hab.—Ava, Khakyen hills; tropical forests of Chittagong.—Fl. R.S.; Fr, C.S.

ANOGEISSUS, Wall.

Calyx compressed, 2-winged, the tube long and slenderly produced beyond the ovary, the limb bell-shaped or urceolate, 5-cleft, deciduous. Petals none. Stamens 10, in two series, the filaments exserted; anthers small, cordate. Ovary 1-celled with 2 suspended ovules; style filiform, with a simple stigma. Fruit small, straight, coriaceous, broadly trapezoid and 2-winged, terminating into the long persistent calyx-tube, 1-seeded. Cotyledons convolute.—Trees, rarely shrubs, with alternate simple leaves. Flowers minute, in slenderly peduncled globular axillary heads.

1. **A. acuminata,** Wall.; Bedd. Sylv. Madr. t. 16; Brand. For. Fl. 228.—*Yoong-pen.*—A leaf-shedding tree (80—100 + 40—80 + 9—12), while young the trunk armed with numerous long spines (abortive branchlets), all softer parts more or less appressed-pubescent; bark about ½ an in. thick, dark brownish grey, densely covered with herbaceous, green, rounded pustules covered with a thin, easily separable, greyish membrane; leaves from lanceolate and ovate-lanceolate to oblong and linear-lanceolate, acuminate, on a short, slender, pubescent petiole, entire, 1-3 in. long, chartaceous, while young more or less densely silky pubescent, more or less glabrescent or quite glabrescent; flowers small, yellowish, crowded and sessile on the spherically thickened apex of the axillary, solitary, short, tawny or rusty pubescent peduncle; calyx densely tawny or rusty tomentose all over, or the limb outside glabrous or sparingly minutely pubescent; fruits glabrous, glossy.

Var. 1. **genuina**: leaves larger and longer, acuminate, usually densely silk-hairy, at least while young; bark densely pustulate; fruits trapezoid, nearly doubly broader than long, the apex and beak tawny pubescent or villous.

Var. 2. **phillyreæfolia** (*A. phillyreæfolia,* Heurk. & Muell-Arg.): leaves smaller, quite glabrous when full grown; bark often marmorate and more or less destitute of the pustules; fruits trapezoid, not much broader than long, quite glabrous and glossy; flower-heads nearly doubly smaller.

Hab.—Var. 1: frequent in the mixed forests all over Burma from Ava and Chittagong down to Tenasserim up to 3,000 ft.; var. 2: restricted to the savannah and swamp forests of the alluvial plains of Prome and Pegu, also Ava.—Fl. Feb.-March; Fr. Apr.-May.—s × l.—SS.= ∞ SiS.

Remarks.—Wood uniformly brown, the heart-wood red-brown, heavy, close-grained, hard, strong, and durable; takes a fine polish. □′=50-57; break-weight=262 pd.—Good for building purposes and indoor-work; exposed to water it soon decays.

QUISQUALIS, L.

Calyx-tube rather terete, very long produced beyond the ovoid ovary, deciduous, the limb 5-parted, small. Petals 5. Stamens 10; anthers ovate. Ovary 1-celled, with 3-4 pendulous ovules; style filiform, with a somewhat dilated stigma. Fruit dry-coriaceous, sharply 5-gonous or almost 5-winged, 1-seeded. Cotyledons (occasionally 3) fleshy.—Scandent shrubs, with opposite or almost opposite simple leaves. Flowers rather showy, in axillary or terminal short spikes or racemes.

1. **Q. Indica,** L.—*Da-wai-hmine.*—A large evergreen woody climber, all younger parts more or less pubescent or villous; leaves oblong to ovate-oblong, on a short tawny or rusty tomentose or puberulous petiole, acuminate, entire, membranous, especially beneath pubescent or sometimes villous, more or less glabrescent, from 2 to 5 in. long; flowers conspicuous, first white, then changing into rose and deep red, supported by a bract, sessile, alternating and distichous, forming short, tawny or rusty pubescent spikes in the axils of the leaves or at the end of the branchlets; bracts leafy, from ovate to linear-lanceolate, acuminate, usually pubescent, gradually smaller and narrower upwards; calyx-tube 2 to nearly 3 in. long, puberulous, hairy inside at the throat; petals elliptically oblong, blunt or nearly so, about ½ an in. long or shorter or somewhat longer, especially outside puberulous; fruits more than an inch long, glossy, deeply furrowed and sharply 5-angular, the angles coriaceous and wing-like.

Var. 1. **genuina**: bracts leafy, from ovate and lanceolate to linear-lanceolate; petals oblong or linear-oblong.

Var. 2. **villosa** (*Q. villosa,* Roxb.): bracts subulate to linear, small and inconspicuous; petals usually obovate and often almost notched.

Var. 3. **oxypetala**: as former, but the petals broadly lanceolate and acute or nearly so.

Hab.—Not unfrequent in the tropical and lower mixed forests from Ava and Pegu down to Tenasserim; var. 3: Ava, Kakhyen hills.—Fl. March-Apr.

CALYCOPTERIS, Lamk.

Calyx-tube elongate-turbinate, obtusely 5-gonus, the limb broadly bell-shaped, 5-cleft, much enlarging after flowering. Petals none.

Stamens 10, in two rows, short, the filaments subulate; anthers didymous. Ovary 1-celled, with three suspended ovules; style subulate with a simple stigma. Fruit 5-gonous and 5-furrowed, crowned by the five spreading chartaceous large calyx-lobes, 1-seeded. Cotyledons convolute.—Scandent shrubs, with opposite simple leaves. Flowers in short axillary racemes often collected into terminal panicles.

Stamens ¼ the length of the acute calyx-lobes . . . . *C. nutans.*
Stamens as long as the bluntish calyx-lobes . . . . . *C. floribunda.*

1. **C. nutans,** Kz.—*Kywot-nay-nway.*—A large scandent shrub, all softer parts more or less covered with a short tawny tomentum; leaves ovate-oblong to oblong, on a short rather slender shortly tomentose petiole, acuminate, entire, 3-5 in. long, chartaceous, above minutely, beneath shortly and usually densely, tawny or brownish pubescent, and while young almost villous; flowers about ⅓ in. in diameter, sessile, yellowish green, supported by a small thickly villous lanceolate bract, forming densely tawny tomentose spikes rarely simple, but usually arranged into more or less leafy-bracted panicles in the axils of the leaves and at the end of the branches; calyx densely and softly tomentose all over, the lobes oblong-lanceolate, acute; stamens 10, the longer ones about ⅓-¼ as long as the calyx-lobes; fruits small, about ⅓ in. long, villous, 5-angled and furrowed between the obtuse angles, crowned by the enlarged bell-shaped calyx-limb of nearly ½ an inch in length.

Hab.—Frequent all over Burma from Chittagong and Ava down to Tenasserim, especially in the mixed forests and along river banks in village-shrubbery, etc., up to 3,000 ft. elevation.—Fl. Jan.-March; Fr. Feb.-May.—l.—SS.=∞.

LUMNITZERA, Willd.

Calyx-tube elongate, tapering at both ends, furnished with two bractlets adnate up to the middle of the tube; limb bell-shaped, equal or unequal, 5-lobed, persistent. Petals 5, spreading. Stamens 5 or 10; filaments filiform-subulate; anthers cordate. Ovary 1-celled with 2 to 5 suspended ovules; style filiform, with a simple stigma. Fruit woody, compressed and obtusely angular, crowned by the persistent calyx-limb, 1-seeded. Cotyledons convolute.—Trees or shrubs, with alternate simple fleshy-coriaceous leaves. Flowers small, in short axillary or terminal racemes or spikes.

Flowers white; stamens 10, about as long as the petals . . *L. racemosa.*
Flowers crimson; stamens 5-10, twice as long as the petals . *L. littorea.*

1. **L. racemosa,** Willd.; Bedd. Sylv. Madr. 103, t. 21, f. 2; Brand. For. Fl. 221.—*Yengyé.*—An evergreen tree (20—40 + (?) + 2—4), remaining shrubby, all parts glabrous and glossy; bark rough; leaves cuneate-obovate, sessile, emarginate, slightly crenate,

fleshy-coriaceous, almost veinless, smooth and glossy, $1\frac{1}{2}$-$2\frac{1}{2}$ in. long; spikes axillary, solitary, usually simple, 6-12-flowered, about as long as the leaves or shorter, the peduncle compressed; flowers sessile, small, white, supported by a very minute basal bract; calyx-teeth small; petals oblong, spreading, afterwards recurved; stamens 10, the alternating ones somewhat longer and about the length of the petals; drupe about $\frac{1}{2}$ in. long, compressed-ovate-oblong, tapering into a narrow furrowed tube crowned with the calyx-limb, fibrous-woody and glossy.

HAB.—Frequent in the littoral forests, especially the tidal ones, and also in the sandy beach-forests, all along the shores from Arracan down to Tenasserim and the Andamans.—Fl. H.S.—l.—SS.=Sal.

REMARKS.—Wood strong and durable, useful for posts and other purposes in house-building.

2. **L. littorea,** Voigt.—An evergreen tree (20—40+(?)+2—4), in all parts agreeing with the former, but the petals are intensely crimson, and the stamens (5-10, usually 7) are about twice as long as the petals, the filaments very slender and crimson.

HAB.—Southern Tenasserim, in mangrove swamps.—Fl. Fr. Sept.—SS.=Sal.

ILLIGERA, Bl.

Flowers hermaphrodite. Calyx-tube narrow-ovoid, constricted beyond the ovary, the limb 5-parted, deciduous, valvate. Stamens 5, epigynous, alternating with as many glands; filaments subulate-filiform, furnished with two spatulate or tubular staminodes at each side at the base; anther-cells opening by a slit along the inner edge; pollen echinulate. Ovary 1-celled, with a solitary pendulous ovule; style filiform, with a dilated stigma. Fruit coriaceous, wingless or broadly 2-4-winged; cotyledons plano-convex.—Scandent shrubs, with alternate 3-foliolate leaves. Flowers subtended by 1 to 3 bractlets, small or middling-sized, forming lax peduncled cymes.

1. **I. appendiculata,** Bl.—A large woody climber with terete branches, the young shoots tawny-velvety; leaves 3-foliolate, on a long glabrous or above slightly pubescent petiole; leaflets on 3-5 in. long petiolules, slightly tawny pubescent above, from ovate-oblong to almost oblong, and obovate-oblong, shortly and bluntish apiculate or almost blunt, entire and somewhat waved, almost coriaceous, $2\frac{1}{2}$-3 in. long, glaucous-green, quite glabrous or slightly pubescent on the nerves beneath, laxly net-veined; flowers rather small, white, supported by a small lanceolate tomentose bract at the base of the very short, thick, tomentose pedicel (often with two or three smaller bractlets on the pedicel itself), in small tawny tomentose or puberulous cymes forming larger, axillary, and

terminal pendulous panicles; calyx tawny-velvety, the lobes linear-lanceolate, acute, petaloid; petals furnished in their sinuses with a cuneate-notched gland; staminodes 10, cucullate and clawed, one at each side of the glandular-puberulous filaments; fruit about 1 in. long, the nut 4-cornered and velvety, 2-winged, the wings broadly oval, very blunt, 1½-2 in. long, chartaceous, striate.

Hab.—Frequent in the tropical forests of the Pegu Yomah and the Martaban hills down to Tenasserim, up to 3,000 ft. elevation.—Fl. Sept.-Oct.; Fr. March.—s : l.—SS. = SiS. Metam.

GYROCARPUS, Jacq.

Flowers unisexual or polygamous, the males numerous. Calyx 4-7-parted, the lobes equal or unequal, imbricate, in the females two of them much enlarging and becoming wing-like in fruit; calyx-tube adnate to the ovary or, in the males, wanting. Petals none. Stamens as many as calyx-lobes, or fewer or none in the females, inserted on the bottom of the calyx and alternating with as many club-shaped staminodes; anthers opening by 2 lateral valves. Ovary absent in males, in the females 1-celled with a solitary pendulous ovule; stigma sessile. Nut bony, terminated by the 2 wing-like elongate coriaceous calyx-lobes. Albumen none.—Trees, with alternate, simple or lobed leaves. Flowers very small, crowded in dense corymbose cymes.

1. G. Jacquini, Roxb.; Bedd. Sylv. Madr. t. 196.—*Penglai-thit-kouk.*—A leaf-shedding tree (60—80 + 40—50 + 4—8), all younger parts more or less puberulous or pubescent; leaves crowded at the end of the thick branchlets, broadly ovate or ovate-oblong, on a 1-4 in. long petiole, more or less acuminate, on young trees often 8-10 in. long and broadly and deeply 3-lobed, those of full-grown trees usually only 4-5 in. long and entire, rarely obsoletely lobed, truncate or cordate at the base, usually glabrous, rarely pubescent beneath or on both sides; peduncles chiefly from the axils of the upper leaves, rarely exceeding the petiole in length, each bearing a repeatedly branched cyme of densely crowded very small greenish yellow flowers, sometimes all males, sometimes with a few hermaphrodite or female ones scattered in the cyme or chiefly in its forks; drupes ovoid, usually about ⅓ in. long, dry, velvety, the two wings erect, obovate-cuneate and narrowly tapering at the base, blunt, 2-2½ in. long, coriaceous, and usually minutely puberulous.

Hab.—Frequent in the coast forests and upper mixed forests, not far from the sea along the Andamans; also Tenasserim.—Fl. R.S.; Fr. C.S.—l.—SS. =SiS. Chloritic rocks.

Remarks.—Wood white, very light and soft. Good for children's toys, boxes; etc.

MYRTACEÆ.

Flowers regular, hermaphrodite or rarely by abortion polygamous. Calyx-tube more or less adnate to the ovary, the limb 4-5- (very rarely 3- or more than 5-) parted or toothed, or reduced to a narrow border or entirely wanting, imbricate or open in bud. Petals usually as many as calyx-lobes, much imbricate in bud, the outer ones sometimes larger in bud than the inner, or rarely all cohering and falling off in an entire operculum. Stamens indefinite, usually numerous, or rarely few and definite, inserted in 1 or several series on a thinner or thicker disk lining the calyx-tube above the ovary or close round the ovary-summit; filaments free, or rarely united at the base or separated into as many bundles as calyx-lobes; anthers versatile or basifix, longitudinally dehiscing or rarely opening in terminal pores. Ovary inferior, or rarely almost superior, but enclosed in the calyx-tube, 2- or more- (very rarely 1-) celled with 2 or more 1- or several-seriate ovules attached to the parietal or axile placentas; style simple, with a small, entire or rarely lobed stigma. Fruit inferior, very rarely half or almost wholly superior and supported by the calyx-tube, crowned with the persistent calyx-limb or its scar, either loculicidally capsular with as many valves as ovary-cells, or indehiscent and berry- or drupe-like. Perfect seeds often few, rarely numerous. Albumen none or almost none. Embryo and cotyledons various.—Trees or shrubs, very rarely undershrubs, with opposite or rarely alternate usually gland-dotted simple leaves. Flowers solitary or variously arranged into axillary or terminal inflorescences. Bracts 1 or more, bractlets 2, often minute and very fugaceous.

More than 50 species of this order, all woody plants, are found in Burma. Astringent principles prevail in the bark, and it is, therefore, often used for tanning purposes. Fragrant, aromatic, or pungent volatile oil is the prevailing quality of *Myrtaceæ*. The buds of *Caryophyllus aromaticus* yield our cloves; all-spice or pimento-pepper is derived from *Pimenta*. Several furnish good dessert-fruits, like guava, jambo, rose-apple. Heavy, usually brown-coloured timber is obtained from the various species of *Eugenia* and *Careya*.

* *Fruit a dry capsule, opening at the top into as many valves as cells to the ovary (very rarely indehiscent).*

○ Stamens free or united into bundles, alternating with the petals. Leaves small or narrow.

\+ Leaves opposite, narrow; stamens free, usually fewer than 20 . . . . . *Baeckea.*

\+\+ Leaves alternating.

Stamens numerous, in a continuous series; flowers not in heads . *Leptospermum.*

Stamens united into 5 free bundles; flowers in heads or spikes . *Melaleuca.*

○○ Stamens united into bundles, opposite the petals; leaves alternate, rarely opposite . . . . *Tristania.*

* * *Fruit an indehiscent berry or rarely a drupe.*
○ Leaves opposite, more or less distinctly gland-dotted.
× Stigma peltate or capitate. Testa of seeds hard.
† Ovary 1-celled, with 2 parietal placentas . . *Rhodamnia.*
†† Ovary 2- or more-celled.
Ovary 5- or rarely 4-celled, with 2-6 ovules in each cell . . *Decaspermum.*
Ovary 2- or more-celled, with numerous ovules in many series in each cell . . . . . *Psidium.*
× × Stigma simple, minute; ovary 2-3-celled with several ovules in each cell; seeds usually few; testa often membranous . . . . . *Eugenia.*
○ ○ Leaves alternate, not dotted.
Stamens all perfect; fruit fibrous-fleshy, with a single large seed without pulp . . . . . *Barringtonia.*
Outer or inner stamens or both without anthers; fruit a large berry with many seeds imbedded in pulp . . . . *Careya.*
Only the inner series of stamens without anthers; berry corticate, 3-4-celled, with several seeds in each cell . . . . *Planchonia.*

MELALEUCA, L.

Calyx-tube bell-shaped or urceolate, at base adnate to the ovary, the limb 5-lobed, imbricate or open in bud. Petals 5. Stamens indefinite, much longer than the petals, united into 5 distinct bundles opposite the petals; anthers versatile, opening longitudinally. Ovary inferior or half-inferior, 3-celled, with few or numerous ovules in each cell attached to the peltate or 2-cleft placenta; style filiform with a peltate or capitate or frequently minute stigma. Capsule enclosed in the enlarged and hardened calyx, crowned by the free part of the tube, loculicidally 3-valved, the valves sometimes separable from the calyx into 3 cocci. Perfect seeds usually few, the testa thin. Embryo straight or hardly curved, the cotyledons flat, plano-convex or folded and embracing each other, longer than the radicle.—Trees or shrubs, with usually alternate, more or less narrow, 1-3- or more-nerved leaves. Flowers supported by a bract, sessile, in heads or spikes.

1. **M. leucadendron,** L.—An evergreen tree (25—30 + 10—15 + 2—3) with pendulous branches, all parts glabrous or the shoots pubescent; bark white, spongy-lamellate, peeling off in large papery flakes; leaves alternate, elliptical to linear-lanceolate, oblique or falcate, blunt, acute, or acuminate, coriaceous, entire, 4-6 in. long, narrowed into a short petiole, 3-7-nerved with anastomosing veins, glaucous-green, glabrous; flowers small, white, in more or less interrupted elongate spikes solitary or several together, the rachis pubescent, tomentose or glabrous; calyx glabrous or pubescent, about 1½ lin. long, the lobes short, orbicular, often with scarious margin; staminal bundles under ½ an inch long, the claws usually short or sometimes longer than the petals, each terminating into 5 to 8 filaments; fruiting calyx usually about 2 lin. in diameter,

varying from globular to almost hemispherical; seeds obovoid or cuneiform.

HAB.—Lower Tenasserim, rare.

TRISTANIA, R. Br.

Calyx-tube turbinate-bell-shaped or open, at the base adnate to the ovary, the limb shortly 5-lobed. Petals 5, much imbricate. Stamens indefinite, more or less united into bundles opposite the petals; free part of filaments filiform; anthers versatile. Ovary more or less inferior or free except the broad base, but enclosed in the calyx-tube, 3-celled, with several ovules in each cell; style filiform with a more or less capitate stigma. Capsule adnate or almost free, enclosed in, or protruding from, the persistent calyx, loculicidally 3-valved. Perfect seeds few in each cell, linear-cuneate, or at the summit expanded into a flat wing, the testa thin. Embryo straight, cotyledons broad and overlapping each other, as long as or longer than the radicle.—Trees or shrubs, with alternate or crowded penninerved leaves. Flowers small, in axillary cymes. Bracts none or very deciduous.

× Calyx-lobes blunt or nearly so.
Leaves sessile or almost so, rigidly coriaceous, glossy on both sides; flowers sessile or nearly so; calyx about 3 lin. in diameter . *T. Merguensis.*
Leaves petioled, thin coriaceous, opaque beneath; flowers pedicelled; calyx only 1¼ lin. in diameter; capsule exserted . . . *T. Burmanica.*
× × Calyx-lobes subulate-acuminate; capsule hardly exserted *T. Griffithii.*

1. **T. Merguensis,** Griff.—An evergreen large shrub, 8 ft. high, the young branchlets and ramifications of the inflorescences more or less sharply angular and minutely puberulous or glabrescent; leaves somewhat crowded at the end of the branches, from lanceolate- to elliptically obovate, more or less cuneate at the base and decurrent on a very short petiole, or often sessile, more or less blunt or almost apiculate, rigidly coriaceous, variable in size, some very small, others 4-6 in. long, glabrous and glossy on both sides, not dotted beneath; flowers middling-sized, yellowish, ill-scented, almost sessile, or on very short, thick, minutely powdery pedicels subtended by a deciduous obovate-lanceolate bractlet of the length of the calyx, forming short, robust, densely puberulous cymes often collected into a dichotomously branched often corymb-like larger one in the axils of the upper leaves; peduncle 2-3 in. long, elongating in fruit; bracts or rather floral leaves small, in shape almost conform with the stem-leaves, deciduous; calyx puberous, about 3 lin. in diameter, densely pubescent inside, the teeth concave, short and blunt; petals rotundate, sinuate, about a line long; filaments united by 6-10 into 5 bundles, puberulous towards the base, about as long as the

petals; ovary whitish tomentose, broadly hemispherical, adnate to the base of the calyx.

Hab.—Lower Tenasserim.—Fl. Aug.

2. **T. Burmanica,** Griff.—*Toung-yoh-pyee-zeng.*—An evergreen tree (20—40 + 2—5), the young shoots pubescent; bark grey, about $\frac{1}{3}$ in. thick, fibrous, peeling off in thin, long, corky-fibrous flakes; cut dry, pale-brown; leaves from obovate-lanceolate to almost lanceolate and obovate, cuneate at the base and narrowed into a longer or shorter puberulous petiole, blunt or sometimes notched, 2-3 in. long, thin coriaceous, somewhat glossy above, beneath pale-coloured, opaque, and dotted; flowers small, white, on rather slender, 1-2 lin. long, slightly pilose pedicels, forming a short-peduncled, small, slightly and shortly pilose dichotomous cyme in the axils of the leaves; bracts linear-lanceolate, small, very deciduous; calyx about $1\frac{1}{4}$ lin. in diameter, puberulous, shortly villous-pubescent inside, the teeth short, rather blunt; petals about $\frac{1}{2}$ lin. long, rotundate; stamens unequal, united by 5-7 into very short bundles free almost to the base, about the length of the calyx-teeth; filaments puberulous; ovary half-superior, hemispherical, silvery-silk-hairy; capsules oblong, slightly appressed, pilose and glabrescent, protruding for more than $\frac{1}{2}$ from the calyx; seeds about 2 lin. long, linear-lanceolate, laterally compressed and trigonous.

Hab.—Not unfrequent in the Eng forests along the eastern slopes of the Pegu Yomah and more frequently from Martaban down to Tenasserim, ascending also the hill Eng and drier hill forests of Martaban up to 3,500 ft. elevation.—Fl. March-Apr.; Fr. Apr.-May.—l.—SS.=Lat. Metam.

3. **T. Griffithii,** Kz.—An evergreen small tree, the leaf-buds imbricate-scaly; leaves crowded at the end of the branchlets, lanceolate, tapering at both ends, almost entire, coriaceous, pellucid-dotted; cymes almost axillary, few-flowered, trichotomous; flowers rather large, white; calyx-tube turbinate; limb 5-parted, turning circumsciss, the lobes ovate, subulate-acuminate, petals rotundate; stamens in 5 bundles, each consisting of numerous stamens; filaments capillary, nearly as long as the petals; capsule hardly exserted, bordered by the circumsciss-annular calyx-limb; seeds angular.

Hab.—Lower Tenasserim.—Fl. Fr. Jan.

RHODAMNIA, Jack.

Calyx-tube ovoid or almost globular, not produced beyond the ovary, the limb 4-lobed, usually persistent. Petals 4, spreading. Stamens numerous, free, in several rows; filaments filiform; anthers versatile. Ovary 1-celled, with several ovules attached to the 2 parietal placentas; style filiform; stigma usually peltate. Berry globular, small, usually crowned by the calyx-limb. Seeds usually few, reniform-globular or variously compressed, the testa hard.

Embryo horse-shoe-shaped, with a long radicle and very small cotyledons.—Shrubs or small trees, with opposite 3- or triplinerved leaves. Flowers usually small, in axillary short racemes or clusters. Bractlets small, deciduous.

1. **R. trinervia**, Bl.—A shrub, the branchlets densely puberulous; leaves from ovate-oblong to ovate-lanceolate, on a 3-4 lin. long petiole, acuminate, coriaceous, 2½-5 in. long, glabrous and glossy above, beneath puberulous and green or covered with a silvery close minute pubescence, transversely nerved and veined between the 3 prominent nerves; flowers small, white, on 1-3 lin. long more or less velvety pubescent pedicels, several together clustered, or rarely solitary or by 2 or 3, in the axils of the leaves, or occasionally collected in a very short axillary raceme; calyx with 2 minute bractlets at base, puberulous or velvety or almost villous-pubescent, the lobes nearly a line long; petals obovate to elliptically obovate, about 2 lin. long; stamens about 40, shorter than the petals; berries almost globular, the size of a small pea, puberulous or glabrous, containing a few or up to 20 angular glossy seeds.

Hab.—Tenasserim, from Moulmein down to Mergui.—Fl. Aug.

DECASPERMUM, Forst.

Flowers polygamously dioecious. Calyx-tube bell-shaped, not or scarcely produced beyond the ovary, the limb 4- or 5-lobed. Petals 4 or 5, spreading. Stamens numerous, in several rows, free; anthers versatile. Ovary 4-or 5-celled, with 2 or very few ovules in each cell, and sometimes each cell divided into 2 by a spurious dissepiment; style filiform with a peltate stigma in the perfect flowers. Berry globular, crowned by the calyx-limb. Seeds few, reniform-globular; the testa hard. Embryo horse-shoe-shaped or circular, the radicle long, the cotyledons short and linear.—Small trees or shrubs, with opposite penninerved leaves. Flowers small in axillary racemes, often forming terminal leafy panicles.

1. **D. paniculatum** (*Nelitris paniculata*, Ldl.).—An evergreen tree (20—25 + 10—15 + ½—1), flowering already while a shrub, the young shoots more or less silky-pubescent; leaves from ovate-lanceolate to almost lanceolate, on a slender puberulous petiole 2 lin. long, sharply acuminate, tapering at the base, 1-3 in. long, thin coriaceous, glabrous above, beneath, while very young, appressed silky-pubescent and glabrescent, the lateral nerves faint; flowers small, white, on 1-2 lin. long slender pubescent pedicels, forming short pubescent sometimes silky and silvery-white racemes in the axils of the leaves and much shorter than them, and usually collected in a more or less leafy panicle at the end of the branchlets; bracts linear-subulate; calyx hemispherical, about ½ lin. long,

silvery silk-hairy, the lobes ovate, acute, almost equal, less pubescent or nearly glabrous, often ciliolate; petals about 2 lin. long, obovate-oblong; -berries globular, the size of a pepper-kernel, minutely velvety, several-seeded.

Hab.—Common in the hill forests of the Martaban hills, and here freely springing up in deserted hill toungyas, at 3,000 to 4,000 ft. elevation; also Tenasserim.—Fl. March.—l.—SS.=Metam.

PSIDIUM, L.

Calyx-tube bell-shaped, urceolate or pear-shaped, adnate at the base or high up, the upper free portion quite entire and closed over the corolla in bud and coming off entire or splitting irregularly. Petals 4 or 5, spreading. Stamens very numerous, inserted in many rows on the usually broad disk, free, the filaments filiform; anthers oblong or linear. Ovary 2-7- (usually 4-5-) celled, with numerous ovules in each cell attached in numerous rows to the two central often 2-lamellate placentas; style filiform, often thick; stigma peltate or capitate. Berry globular to pear-shaped, crowned by the calyx-limb, or the latter deciduous. Seeds few or many, the testa hard. Embryo curved, horse-shoe-shaped or almost circular, radicle very long, the cotyledons small.—Trees or shrubs, often villous or tomentose, with opposite penninerved leaves. Flowers usually rather large, by 1-3 on axillary or lateral peduncles, rarely numerous and cymose.

1. **P. guyava,** L.; Brand. For. Fl. 232.—*Ma-la-ka-pen.*—An evergreen tree (20—30+(?)+2—3), [a low shrub in a wild state in Sumatra, etc.], the young branches pubescent; bark quite smooth, greyish brown, peeling off in thin almost paper-like flakes; leaves oblong to ovate, on a very short strong petiole, usually acuminate or almost blunt, 3-5 in. long, appressed pubescent beneath, glabrescent, the lateral nerves parallel and very strong with conspicuous transversal veins and net-veination between; flowers rather large, white, fragrant, solitary or by 2-3 on ½-1 in. long pubescent peduncles arising either solitary or rarely by 2-3 from the axils of the leaves; bractlets under the calyx 2, subulate; calyx-tube ovoid or globular, densely puberulous, the lobes broadly ovate, acute, nearly as long as the adnate part; petals broad, fully ½ an in. in diameter; berries large, the size and shape of an apple or pear, fleshy, many-seeded, crowned by the calyx-limb, when fully ripe yellow and glossy.

Var. 1. **pyriferum** (*P. pyriferum,* L.): peduncles 1-flowered; fruits pear-shaped.

Var. 2. **pomiferum** (*P. pomiferum,* L.): peduncles usually 2-flowered with a third flower in the fork; fruits globose or ovoid.

HAB.—Generally cultivated in and around villages all over Burma, and sometimes half wild in village bushes.—Fl. Apr.-May; Fr. R.S.—SS.=∞.

EUGENIA, L.

Calyx-tube from globular to narrow-turbinate and club-shaped, not or more or less produced beyond the ovary; lobes 4 or rarely 5, from large and imbricate to very short and hardly prominent on the truncate limb. Petals 4 or very rarely 5, either free and spreading, or more or less connivent, or connate and falling off in a single calyptra. Stamens numerous, in several series, free or collected into 4 obscure bundles; anthers versatile. Ovary 2- or very rarely 3-celled, usually with several ovules in each cell; style subulate, with a simple minute stigma. Fruit a berry or almost drupe-like, or nearly dry with a fibrous rind. Seeds either solitary and globular, or few and variously shaped by compression, the testa usually membranous, rarely cartilaginous. Embryo thick and fleshy, radicle very short, the cotyledons either united in an apparently homogeneous mass or more or less separable.—Trees or shrubs, with opposite, entire, penninerved leaves. Flowers large or small, in terminal or axillary inflorescences, rarely solitary. Bracts and bractlets usually minute and very fugaceous, rarely leafy and persistent.

* *Calyx smooth inside, without an intrastaminal thickened ring; flowers usually small, the calyx-limb often obsolete and turning truncate after flowering. Berries often small, globular to ovoid, more or less sappy,* 1- *rarely* 2-*seeded.*

○ Calyx elongate or shorter, and then more or less obversely conical.

× Flowers in simple or almost simple axillary racemes. Berries ovoid. Calyx very elongate.

Calyx tubular-narrowed, 1-½ in. long, the lobes broad and rounded; berry about an inch long, ovoid-oblong, crowned with calyx-lobes . . . . . *E. claviflora.*

Calyx clavate, ⅓-½ in. long, the limb truncate; berry clavate-oblong, only ⅓ in. long, crowned with the cup-shaped truncate calyx-limb . . . . . *E. leptantha.*

×× Flowers in more or less corymb-like axillary and terminal panicles. Calyx shorter.

\+ Calyx contracted in a pedicel-like base.

Calyx smooth; leaves somewhat glaucous beneath; berries black . *E. grata.*

Calyx in a dried state granular-rough; berries white; leaves rather glossy beneath . . . . . *E. Zeylanica.*

\+\+ Calyx sessile, not pedicel-like narrowed. Flowers in terminal (and sometimes also axillary) corymb-like panicles.

Leaves more or less linear, net-veined between the remote, indistinct, irregular, lateral nerves; a shrub . . . . . *E. contracta.*

Leaves more or less oblong, somewhat glaucescent beneath, not net-veined between the approximate parallel lateral nerves; a tree . . . . . *E. bracteolata.*

○○ Calyx hemispherical to funnel-shaped, sessile or pedicel-like contracted at base.

× Leaves usually opaque, ordinarily green, the lateral nerves more or less distant, somewhat irregular and net-veined between. Inflorescence usually lateral from the older branches.

\+ Calyx sessile, without a pedicel-like tapering base.

† Leaves not glaucous beneath.

Petiole ½-⅔ in. long; leaves not decurrent, broader; flowers more than 3 together; panicle longer peduncled, the last ramifications very short . . . . . *E. operculata.*

As former, but leaves more obovate; panicle very short peduncled or almost sessile, more lax; flowers often by threes . . *E. obovata.*

Leaves acuminately decurrent in a short petiole, more acuminate . *E. paniala.*

†† Leaves glaucous or glaucescent beneath.

Branchlets terete or nearly so; panicles more or less peduncled; calyx lobes obsolete, soon truncate . . . . . *E. cinerea.*

\+\+ Calyx narrowed in a longer or shorter pedicel-like base; panicles short, sessile or nearly so, usually branched already from the base.

† Lobes of calyx-limb distinct, up to ½ a lin. long.

Similar to *E. cinerea*, the branchlets greyish . . . . *E. praecox.*

Branchlets brownish; racemes sometimes corymb-like, slender, short . . . . . *E. cerasoides.*

†† Lobes of calyx-limb obsolete, the limb soon truncate.

Branchlets brown, at least while young (often wingedly) 4-cornered . . . . . *E. tetragona.*

Branchlets white, terete; panicles cyme-like, short . . . *E. balsamea.*

×× Leaves usually glossy, often drying blackish or brownish, the lateral nerves all thin and vein-like, more or less narrowly parallel-running.

\+ Calyx narrowed in a larger or shorter pedicel-like base.

† Inflorescence lateral from the older branchlets.

Calyx a line long, almost sessile; ramifications of panicle sharply 4-cornered; berries ovoid, the size of a pea; branchlets brownish . . . . . *E. fruticosa.*

Calyx 2 lin. long, tapering in a thick pedicel-like base; ramifications of the panicle obsoletely 4-cornered; berries ovoid-oblong, ½ in. long; branchlets white . . . . . *E. Jambolana.*

†† Inflorescence terminal (and often on the same branch also axillary).

△ Branchlets brown.

‖ Leaves bluntish acuminate to blunt.

Leaves thin coriaceous, the lateral nerves thin, but distinct; petiole 3 lin. long, slender . . . . . *E. cymosa.*

Leaves firmly coriaceous, the lateral nerves obsolete; petiole thick, not above a line long . . . . . *E. myrtifolia.*

‖ ‖ Leaves long and sharply acuminate.

Leaves almost chartaceous, pale-coloured beneath; petiole about 2 lin. long . . . . . *E. acuminatissima.*

△△ Branchlets white.

Leaves bluntish acuminate, almost chartaceous, elegantly transversely veined . . . . . *E. venusta.*

\+\+ Calyx not or almost not contracted at the base, sessile. Leaves drying black or reddish.

† Branchlets white.

Leaves chartaceous; calyx-lobes about a line long; petals 2 lin. long or longer; filaments 4-5 lin. long . . . . . *E. rubens.*

Leaves of a thicker texture, the lateral nerves strong and prominent; calyx-lobes and petals shorter; filaments 2-3 lin. long; berries obovoid . . . . . *E. Thumra.*

† † Branchlets red-brown.

Habit of former, but lateral nerves thin and vein-like; berries almost globular, the size of a large cherry . . . . . *E. oblata.*

* * *Calyx usually with a circular or 4-angular intrastaminal ring or the stamens on the thickened ring itself, the limb conspicuously 4-lobed, persistent; flowers often conspicuous. Berries usually large, more or less turbinate or ovoid, the endocarp thick, fleshy. Seeds large, few or solitary, usually accompanied by abortive ones.*

○ Calyx-lobes in fruit spreading.

× Calyx less than ½ an in. long.

\+ Flowers sessile.

† Leaves firmly coriaceous, glossy, the lateral nerves thin, parallel. Flowers in terminal and often also in axillary panicles.

Leaves 5-6 in. long, blunt or nearly so; panicles corymb-like, peduncled; berry obovoid-pear-shaped, about an inch long . *E. grandis.*

Leaves only 2-3 in. long, decurrent at base, bluntish apiculate . *E. lepidocarpa.*

Leaves cuneate at base; flowers in sessile reduced cluster-like panicles; ramifications very short and thick, joint-like . . . *E. pachyphylla.*

† † Leaves coriaceous, opaque, lateral nerves curved and distant.

Leaves long-petioled; panicle terminal, corymb-like . . . *E. tristis.*

\+ + Flowers pedicelled. Leaves more or less chartaceous, the lateral nerves curved.

Flowers in axillary and terminal panicles; calyx-base thick, pedicel-like, the true pedicel very short or almost none . . . *E. lanceæfolia.*

Flowers in simple, slender, lateral, or axillary racemes; calyx-base filiform and pedicel-like; pedicels filiform, long . . . *E. Kurzii.*

× × Calyx an inch long or longer.

Leaves large, almost sessile, cordate or rounded at base; corymbs lateral and terminal . . . . . *E. formosa.*

○ ○ Calyx-lobes in fruit incurved or inflexed.

× Flowers sessile or nearly so.

Leaves cordate or rounded at base, the petiole very short and thick; corymbs terminal . . . . . *E. macrocarpa.*

Leaves sessile with a cordate base, blunt; branchlets white, terete; corymbs small, lateral . . . . . *E. amplexicaulis.*

Leaves petioled, acuminate at both ends; panicles cluster-like reduced, lateral . . . . . *E. Malaccensis.*

× × Flowers truly or spuriously pedicelled.

\+ Leaves whorled by threes, narrow, obtuse at base.

Leaves linear-lanceolate, almost sessile or very shortly petioled; petals 4-16 . . . . . *E. polypetala.*

\+ + Leaves opposite.

† Leaves rounded at base. Fruits obversely turbinate, waxy, white or rose-coloured.

Branchlets usually 4-cornered and often wingedly so, white or pale-coloured; leaves acuminate, the marginal nerve as strong as the nerves themselves . . . . . *E. aquea.*

Branchlets terete, brown; leaves bluntish, the marginal nerve faint . . . . . *E. Javanica.*

†† Leaves acute at base, narrow, petioled.
Fruit almost globular or ovoid, dull-yellow . . . . . *E. Jambos.*

* *Calyx smooth inside, without an intrastaminal thickened ring; flowers usually small, the limb often obsolete and turning truncate after flowering. Berries often small, globular to ovoid, more or less sappy,* 1- *rarely* 2-*seeded.*

○ *Calyx elongate, or shorter and in this case more or less obversely conical.*

1. **E. claviflora,** Roxb.—An evergreen tree (25—30 + 3—6 + 2½—4), all parts quite glabrous; leaves lanceolate, acute at the base, on a short stout, or rather slender petiole 1-3 lin. long, acuminate, thin coriaceous, 3-6 in. long, glabrous, the midrib impressed above, prominent beneath, the lateral nerves numerous, irregular, faint, anastomosing towards the margin; flowers variable in size, from ½ to 1 in. long, sessile or nearly so, forming axillary, short, glabrous racemes (sometimes reduced or, according to Roxburgh's figure, short-panicled with small bracts) in the axils of the leaves; calyx elongate, tubular, tapering at base, the limb 4- or 5-lobed, the lobes rounded and broad, but short; petals 4 or 5, free, white, orbicular-obovate, about 3 lin. long; filaments slender, glabrous; berries ovoid-oblong, about an inch long, bluish black, smooth, sappy and edible, 1-seeded, crowned by the incurved calyx-limb.

Hab.—Not unfrequent in the tropical coast forests of the Andamans; also Chittagong and Tenasserim.—Fr. Feb.—s.

2. **E. leptantha,** Wight.—An evergreen tree (25—30 + 6—8 + 3—4), all parts glabrous; leaves lanceolate to oblong-lanceolate, acuminate at both ends, on a 1-2 lin. long petiole or almost sessile, thin coriaceous, entire, 2-4 in. long, glabrous, the midrib impressed above and prominent beneath, the lateral nerves numerous, faint, more or less irregular, anastomosing along the border; flowers rather small, about ⅓ to ½ in. long, sessile, with a filiform calyx-base, forming a short, glabrous raceme (sometimes reduced, or the basal flowers ternary on a very short peduncle) in the axils of the leaves or above the scars of the fallen ones; calyx smooth, clavate-funnel-shaped, about ⅓ in. long or somewhat filiform-tapering at the base, the limb almost truncate; petals 4 or 5, orbicular, clawed, about a line long or longer, free; filaments glabrous; berries clavate-obovate, about ⅓ in. long, smooth, 1-seeded, crowned by the truncate cup-shaped limb.

Hab.—Rather rare in the tropical forests along the eastern and southern slopes of the Pegu Yomah; also Tenasserim and more frequently in the coast forests of the Andamans.—Fl. Feb.; Fr. Apr.-May.—s.—SS.=SiS.

3. **E. grata,** Wall.—An evergreen small tree, all parts glabrous; leaves ovate-oblong and lanceolate to narrow-lanceolate,

on a 1-2 lin. long petiole, acute or obtuse at the base, bluntish acuminate, 2-3 in. long, coriaceous, entire, glabrous, somewhat glaucous and opaque beneath, the midrib impressed above and prominent beneath, the lateral nerves unequal, faint, anastomosing towards the margin; flowers rather small, white, sessile, with a pedicel-like calyx-base, usually by 3-7, forming a brachiate glabrous panicle in the axils of the leaves and at the end of the branchlets; calyx smooth, in a dried state longitudinally folded-wrinkled, about ¼ in. long, contracted in a short pedicel-like stalk, the 5 lobes broad and narrow, rounded or somewhat acute; petals 5, almost orbicular, about a line long; filaments slender, glabrous; berries ovoid, elliptical, the size of a pea, smooth, blackish (?), somewhat pruinous, crowned by the short calyx-limb, 1-seeded.

Hab.—Tenasserim, apparently frequent.—Fl. Jan.-March.

4. **E. Zeylanica,** Wight.; Bedd. Sylv. Madr. t. 202.—*Thabyay-pouk.*—An evergreen tree (25—30+8—12+2—3), all parts glabrous; leaves ovate-lanceolate to lanceolate, obtuse or acute at base, on a 1-2 lin. long petiole, 1-2½ in. long, entire, bluntish acuminate, thin but rigidly coriaceous, glossy on both sides, beneath somewhat pale-coloured, the midrib impressed above and prominent beneath, the lateral nerves numerous, rather parallel, very faint, anastomosing towards the margin; flowers white, sessile, with a pedicel-like calyx-base, usually ternary and forming a rigid brachiate glabrous panicle in the axils of the upper leaves and at the end of the branchlets; calyx obovate-cuneate, at the base pedicel-like contracted, usually granular-tubercled, pruinous, about 2 lin. long, the 4 or 5 lobes small and rounded; petals 4 or 5, almost orbicular, about a line long, free; filaments long and slender, glabrous; berries globular, white, the size of a pepper-kernel or very small pea, crowned by the lobed calyx-limb, sappy, 1-seeded (?).

Hab.—Not unfrequent in the tropical forests of the Andamans; also in Tenasserim.—Fl. May-June.—s.—SS.=SiS. Chloritic rocks.

5. **E. contracta,** Wall.—An evergreen small shrub, 2-4 ft. high, all parts quite glabrous; leaves linear to linear-oblong, acuminate at the base, on a rather strong petiole 1-2 lin. long, bluntish or bluntish acuminate, entire, thin chartaceous, 2-3 in. long, glabrous, the midrib somewhat impressed above and prominent beneath, the lateral nerves and the confluent copious net-veination faint, but prominent, anastomosing towards the margin; flowers small, white, by 3-5, sessile with a narrow calyx-base, forming a glabrous, brachiate, stiff, corymb-like panicle at the end of the branchlets and occasionally in the axils of the leaves; calyx tubular-funnel-shaped, about 2 lin. long or a little longer, smooth, the limb widened, almost truncate, the 4 lobes

forming only a narrow margin; petals 4, orbicular, free but calyptrate, deciduous; filaments slender, glabrous; berries unknown.

Hab.—Frequent in the stony or rocky beds of choungs in tropical forests from Martaban east of Tounghoo down to Tenasserim.—Fl. March-Apr.—l.—SS. =Metam.

Remarks.—Wood rather heavy, of a somewhat unequal fibre, but close-grained, yellowish white turning pale-brownish, rather soft.

6. **E. bracteolata,** Wight.—An evergreen tree, all parts glabrous, the branchlets greyish; leaves oblong to obovate-oblong, acute or acuminate at the base, on a 2-4 lin. long petiole, bluntish or blunt-apiculate, 3-5 in. long, entire, chartaceous, glabrous, glaucescent beneath, the midrib not impressed above, prominent beneath, the lateral nerves very thin and numerous, parallel, anastomosing near the margin; flowers small, white, sessile, usually by 3 or more, forming a brachiate, shorter or longer peduncled, glabrous, corymbose panicle, the ramifications sharply 4-gonous; bracts and bractlets small, but distinct, ovate, acute, thick coriaceous; calyx about a line long or a little longer, obversely conical, the limb 4-lobed, lobes broadly rotundate; filaments rather short, but slender, glabrous; petals 4, calyptrately deciduous; unripe berry oblong, smooth, crowned by the 4-lobed incurved calyx-limb, 1-seeded.

Hab.—Tenasserim.

○○ *Calyx hemispherical to funnel-shaped, sessile or pedicel-like contracted at the base.*

7. **E. operculata,** Roxb.; Brand. For. Fl. 234 (*E. nervosa,* Bedd. Sylv. Madr. 106, not DC.).—*Tea-thaby-ay.*—An evergreen tree (30—50 + 5—15 + 3—6), all parts glabrous; leaves variable, from ovate-oblong to elliptical and elliptically obovate, acute at the base, on a ½-⅔ in. long petiole, bluntish apiculate to bluntish and shortly acuminate, 4-7 in. long, chartaceous, entire, glabrous, the numerous nerves thin but prominent, pretty regular and rather close, anastomosing towards the margin, the net-veination thin and lax; flowers small, white, sessile, clustered by 3 or more and forming a brachiate, shorter or longer peduncled, glabrous panicle above the scars of the fallen leaves; calyx cyathiform, funnel-shaped, narrowed at the base, 1½-2 lin. long, smooth, the limb truncate; petals 4, concave-orbicular, about a line long or somewhat longer, free; filaments rather short, glabrous; berries more or less globular, the size of a pea, sappy, purplish-black, crowned by the cup-shaped calyx-limb, usually 1-seeded.

Var. 1. **operculata** (*E. operculata,* Roxb.): flowers more than 3 together; panicle longer peduncled, the extreme ramifications very short; leaves more acuminate.

Var. 2. **obovata** (*E. obovata,* Wall.): leaves more obovate, more

or less apiculate; panicles very short peduncled or almost sessile, more lax; flowers usually by threes.

HAB.—Var 1: not unfrequent in the swamp forests of Pegu, Martaban, and Upper Tenaserim; var. 2: Burma, probably Ava.—Fl. May.—SS.=All. Metam.

8. **E. Paniala,** Roxb.—An evergreen large tree, all parts quite glabrous; leaves lanceolate to broadly or obovate-lanceolate, cuneate-acuminate at the base and decurrent on the short ¼ to ⅓ in. long petiole, acuminate, 3-5 in. long, entire, thick chartaceous, glabrous, the lateral nerves copious, thin but prominent, rather regular, arcuately anastomosing towards the margin; flowers small, sessile, usually by threes, clustered, forming a longer or shorter peduncled, brachiate, often large panicle above the scars of the fallen leaves; calyx cyathiform, about 1½ lin. long, tapering at base, smooth, the limb obsoletely and roundedly 4-toothed, soon truncate; petals 4, about a line long, orbicular, free; filaments rather short, glabrous; berries (accord. Roxburgh) about the size of a small gooseberry and very juicy.

HAB.—Chittagong.—Fl. Apr.; Fr. June.

9. **E. cinerea,** Wall.—An evergreen tree, all parts glabrous, the branchlets terete or nearly so, whitish; leaves broadly lanceolate to oblong-lanceolate, cuneate-acuminate at the base, on a ½-¾ in. long petiole, bluntish acuminate, 3-5 in. long, entire, pergamaceous, glabrous, opaque, more or less pale-coloured beneath, the lateral nerves thin, but prominent, rather distant, somewhat arched, anastomosing towards the margin, with very faint or obsolete net-veination between; flowers small, white, sessile, clustered usually by 3, forming a brachiate, sessile, from the base divided or peduncled, glabrous panicle arising from the end of the older branchlets or laterally from the base of the young shoots; calyx about a line long, smooth, obversely conical, the limb shallowly and obsoletely 4-lobed and soon turning truncate; petals 4, orbicular, hardly a line long, calyptrately deciduous (?); berries globular, the size of a pepper-kernel, sappy, purplish black, smooth, crowned by the minute calyx-limb, 1-seeded.

HAB.—Very rare in the tropical forests of the southern parts of the Pegu Yomah; Tenasserim, from Moulmein down to Mergui.—Fl. Apr.; Fr. Feb.—s.—SS. = SiS.

10. **E. praecox,** Roxb.—An evergreen stout tree, all parts glabrous, the branchlets greyish; leaves oblong-lanceolate, acute at the base, on a ½ in. long petiole, 3-5 in. long, rather blunt, glabrous, coriaceous (?), glaucescent beneath, the lateral nerves coarse, rather distant and curved, anastomosing along the margin; flowers small, white, sessile, with a narrow pedicel-like calyx-base, usually by 3, forming rather short, brachiate, glabrous panicles, which are

simple and peduncled or sessile and branched from the base, and arise from above the scars of the fallen leaves and from the axils of the leaves; calyx about a line long, hemispherical, narrowed in a pedicel-like base of the length of the calyx itself, smooth, the limb distinctly 4-lobed, the lobes rounded, nearly $\frac{1}{3}$ lin. long; petals 4, obovate-orbicular, somewhat longer than a line, free; filaments very long and slender, glabrous.—(Description after Roxburgh's MS. drawing.)

Hab.—Hilly parts of Chittagong.—Fl. January.

11. **E. tetragona,** Wight.—An evergreen tree, all parts glabrous, the branchlets brown, 4-cornered (the young shoots often wingedly so), the older ones turning more or less terete; leaves elliptically oblong to obovate-oblong, acute to cuneate at the base, on a strong $\frac{1}{3}$ to $\frac{1}{2}$ in. long petiole, entire, coriaceous, 3 to 6 in. long, blunt-apiculate or shortly and bluntish acuminate, glaucescent and opaque beneath, the lateral nerves thin but prominent, rather distant, anastomosing along the margin; flowers small, white, sessile with a narrowed calyx-base, usually by threes, forming stiff, short, brachiate, glabrous, sessile panicles branched already from the base, solitary or several together arising from above the scars of the fallen leaves or rarely axillary; calyx smooth, hemispherical, about a line long, with a thick pedicel-like contracted base nearly as long, the limb obsoletely and broadly toothed and truncate; petals 4, orbicular-concave, free (?); filaments short, glabrous; berry globular, the size of a pea, smooth, 1-seeded.

Hab.—Ava, Kakhyen hills, at 3,000 to 4,000 ft. elevation.—Fl. Nov.-Jan.

12. **E. cerasoides,** Roxb.—*Thabyay-chin.*—An evergreen tree (40—60—18—30 + 5—8), all parts quite glabrous, the branchlets brownish; leaves oblong-lanceolate to broadly and almost obovate-lanceolate, acute or acuminate at the base, on a short 2 to 3 lin. long petiole, bluntish acuminate or apiculate, 2-3½ in. long, entire, thick chartaceous, glabrous, the lateral nerves thin but prominent, rather distant but irregularly curved, arcuately anastomosing; flowers small, white, sessile, with a narrow pedicel-like calyx-base, usually by threes, forming brachiate, rather slender, glabrous, sometimes corymb-like racemes arising solitary or by 2 or even 3 from above the scars of the fallen leaves along the older branches below the leafy terminal branchlets; calyx hardly a line long, hemispherical, smooth, contracted in a short pedicel-like base, the limb distinctly 4-lobed, the lobes broadly rotundate, small; filaments slender but rather short, glabrous; berries globular, the size of a large pea or small cherry, purplish black, smooth, sappy, crowned by the involute 4-lobed calyx-limb, 1-seeded.

Hab.—Chittagong; Tenasserim as far south as Mergui.

13. **E. balsamea,** Wight.—An evergreen tree, all parts glabrous, the branchlets white; leaves obovate-oblong to oblong-lanceolate, cuneate or acuminate at the base, on a 2-3 lin. long petiole, bluntish or bluntish apiculate, chartaceous, entire, 3-5 in. long, glabrous, pale green on both sides, the lateral nerves rather distant, thin but prominent, almost curved and anastomosing towards the margin; flowers small, white, sessile, with a slender, abruptly contracted, pedicel-like calyx-base of about a line length, usually by 3 (the middle one often sessile), forming small, slender, brachiate, glabrous, corymb-like panicles usually arising by 2-3 above the scars of the fallen leaves or in the leaf-axils themselves; calyx cyathiform, smooth, hardly a line deep, abruptly contracted in the pedicel-like clavate base; limb minutely 4-toothed, soon turning truncate; petals 4; filaments rather short, glabrous; berries (unripe) globular, smooth, crowned by the truncate cup-shaped calyx-limb, 1-seeded.

HAB.—Burma (according Dr. Mason); probably to be found in the Arracan or Ava hills.

14. **E. fruticosa,** Roxb.—*Thabyay-nee.*—An evergreen tree (40—50+15—20+4—6), all parts quite glabrous, the branchlets brown; bark grey, 1 in. thick, minutely fissured, conchoidly peeling off; cut brown; leaves elliptically oblong to oblong-lanceolate, acute at the base, on a $\frac{1}{3}$-$\frac{1}{2}$ in. long petiole, bluntish or apiculate, 2-3 in. long, entire, thin coriaceous, glabrous, the midrib impressed above and prominent beneath, the lateral nerves very numerous, faint, irregularly parallel, anastomosing towards the margin; flowers small, white, sessile, clustered by 3 or usually more, forming a brachiate, rigid, glabrous panicle arising from above the scars of the fallen leaves along the older branches below the leafy shoots; calyx obversely conical, sessile, smooth, about a line long, the limb truncate; petals 4, usually calyptrately deciduous; filaments slender, glabrous; berries ovoid, the size of a small pea, smooth, bluish black, crowned by the truncate cup-like calyx-limb, 1-seeded.

HAB.—Frequent in the open, especially the Eng forests, along the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim; also Chittagong.—Fl. Apr.; Fr. May-June.—l.

REMARKS.—Wood hard, heavy, brown.

15. **E. Jambolana,** Lamk.; Bedd. Fl. Sylv. t. 197; Brand. For. Fl. 233, t. 30.—*Thabyay-hpyoo.*—An evergreen tree (50—80+18—30+5—12), often shedding leaves in the drier parts of Burma during H.S., all parts quite glabrous, the branchlets white; bark grey, about an inch thick, fibrous, and peeling off in small rounded flakes; cut red; leaves elliptically oblong to broadly and obovate-lanceolate, acute or acuminate at the base, on $\frac{1}{2}$-1 in. long petiole, bluntish acuminate, entire, thin coriaceous,

2-4 in. long, glabrous, the midrib impressed above and prominent beneath, the lateral nerves all very numerous and very faint, irregularly parallel and anastomosing along the margin; flowers small, whitish, sessile, with a thick pedicel-like calyx-base, usually by 3 or more clustered and forming a brachiate, glabrous, rigid panicle above the scars of the fallen leaves below the younger leafy branchlets; calyx funnel-shaped, about 2 lin. long, smooth, the thick base pedicel-like; limb obsoletely and broadly 4-lobed, soon truncate; petals 4, orbicular, about a line long, calyptrately deciduous or free; filaments long, glabrous; berries ovoid-oblong, often somewhat oblique, about ½ in. long, purplish black, sappy, smooth, crowned by the truncate calyx-limb, 1-seeded.

Hab.—Frequent all over Burma in all kinds of leaf-shedding forests, but chiefly in the mixed forests, entering also the tropical forests, up to 2,000 ft. elevation.—Fl. Apr.-May; Fr. May-June.—s+l.—SS.=∞.

Remarks.—Wood heavy, hard, brown, close-grained, but brittle. Bark, like that of most other species of this genus, good for tanning purposes.

16. **E. cymosa,** Lamk.—An evergreen shrub, 4-6 ft. high or higher, and growing out into a little tree, all parts quite glabrous, the branchlets brown, almost terete; leaves from elliptical to elliptically-oblong and broadly lanceolate, on a slender 1 to 2 lin. long petiole, acute at the base, bluntish cuspidate-acuminate, 1½ to 2½ in. long, thin coriaceous, entire, glossy, glabrous, in a dried state fuscous-black, the midrib impressed above and prominent beneath, the lateral nerves very faint, numerous and approximate, parallel, anastomosing along the margin; flowers small, white, sessile, with a contracted short pedicel-like calyx-base, often by 3, forming a brachiate, corymb-like, glabrous panicle in the axils of the leaves and at the end of the branchlets, the ramifications obsoletely 4-cornered; calyx cyathiform, about a line long, tapering in a pedicel-like base; limb wide, almost truncate, the 4 lobes obsolete, repand; petals 4, orbicular, free; filaments slender, glabrous; berries almost globular or didymous, the size of a pea, sappy, bluish black, crowned by the cup-shaped calyx-limb, 1- or 2-seeded.

Hab.—Southern Tenasserim.—Fl. Nov.

17. **E. myrtifolia,** Roxb.—An evergreen large shrub or small tree, all parts glabrous; leaves from lanceolate to oblong-lanceolate, or occasionally elliptical, acute at the base, on a short up to a line long petiole, bluntish, blunt-apiculate or bluntish acuminate, 1-2½ in. long, thin but rigidly coriaceous, entire, glabrous, glaucescent beneath, the midrib impressed above and slightly prominent beneath, the lateral nerves almost invisible; flowers small, white, sessile, with a short pedicel-like calyx-base (the lower ones often

spuriously jointed-pedicelled), forming a brachiate, more or less raceme-like, stiff, glabrous panicle in the axils of the upper leaves and at the end of the branchlets; calyx nearly 1½ line long, bell-shaped, shortly and pedicel-like contracted at the base, smooth, the limb almost truncate, with 4 minute broad teeth; petals 4, orbicular, about a line each way, free, but calyptrately deciduous; filaments slender, glabrous; berries globular, the size of a pea, sappy, bluish black, smooth, crowned by the cup-shaped truncate calyx-limb, 1-seeded.

HAB.—Tenasserim, Moulmein district.

18. **E. acuminatissima,** Kz.—An evergreen tree, all parts glabrous; leaves lanceolate to oblong-lanceolate, acuminate at the base, on a 2-3 lin. long petiole, long caudate-acuminate, 2½-3½ in. long, thin coriaceous, entire, glabrous, somewhat pale-coloured beneath, the midrib impressed above and prominent beneath, the lateral nerves faint, irregular, anastomosing towards the margin; flowers small, white, sessile, with a pedicel-like contracted calyx-base, usually by threes, forming a brachiate, rather compound, glabrous panicle at the end of the branchlets; calyx hemispherical, contracted in a pedicel-like about a line long base, glabrous and smooth, about a line long, the limb almost truncate; petals 5-6, free, minute; filaments very short, glabrous; anthers didymous.

HAB.—Tenasserim or Andamans.

19. **E. venusta,** Roxb.—*Thabyay-kha.*—An evergreen tree (50—70+20—25+6—8), all parts quite glabrous, the branchlets greyish; bark grey, an inch thick, rather smooth and soft; cut dryish, brownish; leaves elliptical to elliptically oval, obtuse or acute at the base, on a slender ⅓ to ½ in. long petiole, rather abruptly and bluntish acuminate, 1½-2½ in. long, thin coriaceous or almost thick chartaceous, entire, glabrous, the midrib impressed above and prominent beneath, the lateral nerves very numerous and crowded, almost obsolete, parallel and anastomosing towards the margin; flowers small, white, sessile, with a pedicel-like contracted calyx-base, usually by threes, forming brachiate, glabrous panicles along the older branchlets and also in the axils of the leaves of the younger branchlets above them, rarely at the same time also terminal; calyx wide-cyathiform, nearly 1½ lin. long, tapering in a slender pedicel-like base up to nearly a line long; limb obsoletely and broadly 4-toothed, soon turning truncate; filaments slender, but rather short, glabrous; berries almost globular, the size of a small pea, sappy, bluish black, crowned by the truncate cup-shaped calyx-limb, 1-seeded.

HAB.—Not unfrequent in the tropical forests of Martaban, east of Tounghoo; also Chittagong, Tipperah hills.—Fl. March-Apr.—s.—SS.=Metam.

REMARKS.—Sap-wood pale-coloured; heart-wood brownish.

20. **E. rubens,** Roxb.—An evergreen large tree, all parts glabrous, the branchlets white; leaves oblong to oblong-lanceolate, acute at the base, on a strong 2-3 lin. long petiole, bluntish acuminate, 4-6 in. long, entire, chartaceous, glabrous, in drying turning black above and reddish beneath, the lateral nerves thin, but prominent, rather copious, parallel, with faint net-veination, anastomosing near the margin; flowers rather small, white, sessile, with a narrowed calyx-base, usually by threes, forming a brachiate, sessile, and from the base branched or short-peduncled, glabrous, corymbose panicle at the end of the branchlets; calyx obconically cyathiform, about 2 lin. long, tapering in a short, thick, pedicel-like base, smooth; limb deciduously 4-lobed, soon truncate, the lobes orbicular-concave, about ½ a line long; petals 4, concave-orbicular, 2 lin. long or somewhat longer, free; filaments slender, about 4 to 5 lin. long, glabrous.

Hab.—Forests of Chittagong; Tenasserim, from Moulmein down to Mergui.—Fl. Feb.-Apr.; Fr. begin. of R.S.

21. **E. Thumra,** Roxb.—*Thaw-thabyay.*—An evergreen tree (40—50+15—20+4—6), all parts glabrous, the branchlets grey; bark roughish, grey, ⅓ in. thick; cut brown, dryish; leaves elliptically oblong to oblong and obovate, rarely oval-oblong, acute or acuminate at the base, on a strong 3-4 lin. long petiole, 4-8 in. long, bluntish acuminate or bluntish, entire, firmly coriaceous, glabrous, in drying turning black above and fuscous beneath, the lateral nerves thin but prominent, rather copious, with intervening, parallel and reticulate veins, anastomosing towards the border; flowers rather small, white, sessile, with a thick calyx-base, usually by 3 to 5, forming a sessile or short-peduncled, brachiate, lax and spreading, or more or less contracted, corymbose, glabrous panicle at the end of the branchlets; calyx obconical, about 2 lin. long or longer, smooth tapering into an obscurely pedicel-like base, about half a line long; limb deciduously 4-lobed and soon truncate, the lobes more than ½ a line long, almost orbicular; petals 4, broader than long, about 1½ lin. broad, free; filaments rather short, but slender, glabrous; berries (unripe) obovoid, at the base contracted in a ½ lin. long stalk or sessile, the size of a cherry, glabrous, crowned by the truncate cup-shaped calyx-limb, 1-seeded, the pericarp corky-fleshy.

Hab.—Frequent in the tropical forests of the Pegu Yomah and more so in those of Martaban down to Tenasserim, especially in marshy or inundated places along streams.—Fl. March-Apr.; Fr. May-June.—s.—SS.=Metam.

Remarks.—Wood heavy, red-brown, close-grained, and rather hard.

22. **E. oblata,** Roxb.—*Thabyay-nee.*—An evergreen tree (40—50+12—20+4—6), all parts glabrous, the branchlets red-brown; leaves oblong to elliptically-oblong, acute at the base, on a 2-3 lin.

long petiole, rather abruptly bluntish acuminate, 3-5 in. long, thin coriaceous, entire, glabrous, turning fuscous in drying, opaque beneath, the lateral nerves very thin and faint, rather numerous, parallel, anastomosing along the margins, faintly parallel-veined between; flowers rather small, white, sessile, with a pedicel-like calyx-base, usually by threes, forming a rather short, brachiate, shorter or longer peduncled, corymbose, glabrous panicle at the end of the branches and often also sessile in the axils of the leaves; calyx about 2-3 lin. long, smooth, campanulate-cyathiform, narrowed in a line long pedicel-like base, the limb shortly and deciduously 4-lobed and soon truncate, the lobes short, blunt; filaments long and slender, glabrous; berries almost globular, broader than long, the size of a large cherry, smooth, purplish black, crowned by the small cup-shaped or occasionally incurvedly lobed calyx-limb, 1-seeded, the pericarp rather thick, corky-fleshy.

Hab.—Frequent in the tropical forests, especially along marshy choungs, from Martaban down to Tenasserim.—Fl. March-May; Fr. June-Aug.—s.—SS.= Metam.

* * *Calyx usually with a circular or 4-angular intrastaminal ring, or the stamens on the thickened ring itself, the limb conspicuously 4-lobed, persistent. Flowers often conspicuous. Berries usually large, more or less turbinate or ovoid, the endocarp thick and fleshy. Seeds large, few or solitary, and usually accompanied by abortive ones.*

○ *Calyx-lobes in fruit spreading.*

23. **E. grandis,** Wight; Bedd. Sylv. Madr. 107.—*Toung-thabyay,* or *thabyay-kyee.*—An evergreen tree (50—60+18—24+4—6), all parts glabrous; branchlets red-brown; leaves more or less broadly to ovate-elliptical, acute or blunt at the base, on a strong petiole about ½ in. long, bluntish apiculate or rarely shortly bluntish acuminate, entire, firmly coriaceous, glabrous, glossy, 4-6 in. long, the lateral nerves thin but prominent, rather numerous, parallel and slightly curved, anastomosing towards the margin, laxly veined between; flowers middling sized, white, sessile, with a contracted calyx-base, clustered by 3 or more, forming robust and rather short, glabrous, brachiate, corymbose panicles either solitary or often by twos in the axils of the upper leaves and terminal; calyx smooth, about 3 lin. long or longer, hemispherical, with a contracted, thick, pedicel-like, 1½-2 lin. long base, the limb 4-lobed, 2 of the lobes petal-like, concave-orbicular, about 2 lin. long, the alternating 2 very short, rounded; petals 4, concave-orbicular, as large as the larger calyx-lobes or somewhat longer; filaments long, glabrous; berries obovoid-pear-shaped, about an inch long or somewhat longer, smooth, crowned by the cup-shaped, truncate (or the lobes often longer persistent), conspicuously scared calyx-limb, usually 1-seeded

Var. 2. **lepidocarpa** (*E. lepidocarpa*, Wall.): leaves doubly smaller, more decurrent at the base, more oboval, the lateral nerves anastomosing nearer to the margin, usually fuscous-blackish beneath.

Hab.—Frequent in the tropical, and occasionally in the moister upper mixed forests of the Pegu Yomah, Martaban, and Tenasserim; var. 2: in the Eng forests of Upper Tenasserim.—Fl. Feb.; Fr. Apr.—s.—SS.=*SiS.* Metam.

Remarks.—Wood heavy, brown, hard and brittle, close-grained.

24. **E. pachyphylla,** Kz.—An evergreen tree, all parts glabrous, the branchlets white; leaves obovate to obovate-oblong, more or less cuneate-acuminate at the base, on a strong petiole 3-4 lin. long, bluntish or blunt-apiculate, 3-4 in. long, entire, firmly coriaceous, glabrous, turning fuscous in drying, the lateral nerves thin but prominent, rather distant and somewhat irregularly parallel, anastomosing towards the margin, the intervening net-veination thin and lax and rather obsolete; flowers middling sized, usually solitary or by threes, sessile, forming a very short, thick, trichotomous panicle at the end of the branchlets, the peduncle and the ramifications very short ($\frac{1}{4}$-1 in. long), very thick and joint-like, 4-gonous; calyx about 4 lin. long, obconical, tapering at the base, smooth, the limb 4-lobed, the lobes about 2 lin. long, rounded, persistent; petals, etc., unknown.

Hab.—Upper Tenasserim, Bithoko range, at 3,000 ft. elevation.—Fl. Apr.

25. **E. tristis,** Kz.—An evergreen tree, all parts glabrous, the branchlets terete, thick, pale brown; leaves elliptical to elliptically obovate, acute at the base, on a thick petiole $\frac{1}{2}$-$\frac{2}{3}$ in. long, blunt-apiculate, coriaceous, entire, 4-5 in. long, glabrous, opaque, the lateral nerves rather strong and prominent, rather distant and somewhat irregular with intervening longitudinal thin veins and rather lax net-veination; flowers unknown; panicle corymb-like, sessile, terminal, glabrous, the ramifications rather short and robust; berries on a thick 1-2 lin. long peduncle, depressed-globose, the size of a cherry, glabrous, crowned by the disk-like spreadingly 4-lobed calyx-limb, 2- or 1-seeded, the endocarp thin, fleshy; calyx-lobes in fruit about $1\frac{1}{2}$ lin. long, rounded.

Hab.—In the Eng forests of Tenasserim.—Fr. Apr.

26. **E. lanceæfolia,** Roxb.—An evergreen very large tree, all parts glabrous; leaves oblong- to broadly-lanceolate, rounded or obtuse at the base, on a $\frac{1}{4}$-$\frac{1}{2}$ in. long petiole, long but bluntish acuminate, 2-3 in. long, entire, rigidly and thinly coriaceous, glabrous, pale-coloured beneath, the lateral nerves thin, but prominent, rather distant and arcuately anastomosing, laxly and transversely veined; flowers rather small, white, sessile, with a pedicel-like calyx-base, usually by 3-5, forming a short, corymbose, brachiate-branched

sessile or almost sessile panicle in the axils of the leaves or above their scars; calyx about 2 lin. long, smooth, contracted in a thick pedicel-like 1½ lin. long base, the limb 4-lobed, the lobes about ½ lin. long, rounded; petals 4, concave-rounded, free, nearly 2 lin. long; filaments very long, glabrous; berries ovoid-oblong, about ½ an in. long, bluish black, smooth, crowned by the 4-lobed inflexed calyx-limb, 1-seeded.

Hab.—Chittagong.—Fl. Nov.; Fr. Feb.

27. **E. Kurzii,** Duthie (*E. cerasiflora,* Kz.).—An evergreen tree (90—100 + 50—60 + 8—10), all parts glabrous, the branchlets whitish, compressed-terete; bark about ⅓ in. thick, whitish grey, uneven; cut brown; leaves more or less broadly lanceolate, acuminate or acute at the base, on an ⅓-⅔ in. long petiole, bluntish acuminate or sometimes blunt-apiculate, 4-7 in. long, entire, chartaceous, glabrous, opaque, pale-coloured beneath, the lateral nerves rather numerous, but irregularly parallel, often somewhat curved, thin, but prominent, anastomosing towards the margin, the transverse veination thin and obsolete; flowers rather small, white, on slender 2-4 lin. long pedicels, forming a short, but slender, glabrous, simple raceme arising from above the scars of the fallen leaves and also often from the leaf-axils themselves; proper calyx about 3 lin. long or a little longer, clavate-turbinate, and narrowed in a more or less slender pedicel-like base of ½ to 2 lin. long, smooth, the limb persistent, 4-lobed, the lobes semi-orbicular, nearly 2 lin. long, 2 of them somewhat smaller; petals about ⅓ in. long, concave-orbicular, free; filaments long, slender; berries globular, or occasionally somewhat didymous-globular, the size of a pea, contracted into a long slender stalk, smooth, crowned with the diskoid spreadingly lobed calyx-limb, 1-2-seeded.

Hab.—Not rare in the tropical forests of Martaban east of Tounghoo.—Fl. March.—s.—SS.=Metam.

Remarks.—Wood heavy, brown, hard, unequally fibrous.

28. **E. albiflora,** Duthie.—An evergreen tree, all parts quite glabrous, the branchlets grey; leaves elliptical to obovate, acuminate at both ends, narrowed into a rather strong petiole about 3-4 lin. long, coriaceous, 3-4 in. long, the lateral nerves irregular, arcuate and little prominent, the net-veination lax and thin; flowers white, usually by threes, on slender pedicels 2-3 lin. long and sometimes elongated to ½ in. in length, forming a corymb-like, axillary, sessile, glabrous panicle slenderly branched from the base and much shorter than the leaves; calyx clavate-narrowed in a stalk, about 2 lin. long or somewhat longer, the teeth conspicuous, ½ lin. long, oval, bluntish.

Hab.—Burma, probably Ava.

29. **E. formosa,** Wall.—An evergreen large tree, all parts glabrous, the branchlets almost terete, pale-coloured; leaves usually large, ovate-oblong to oblong, rounded or almost cordate at the base, on a strong and very short petiole or almost sessile (the upper ones usually whorled by threes), ½ to 1½ feet long, acuminate, entire, coriaceous, glabrous, pale-coloured and opaque beneath, the lateral nerves numerous and somewhat curved, slightly arcuate-anastomosing towards the margin, laxly and faintly net-veined between; flowers large, pale rose-coloured, solitary or by threes, on a ⅓-½ in. long pedicel, narrowly 2-bracteolate at the apex, forming a short, simple or corymb-like, glabrous raceme at the end of the branchlets or arising laterally from above the scars of the fallen leaves; calyx about ⅔ to ¾ in. long, smooth, clavate-turbinate, the limb 4-lobed, persistent, the lobes broad, rounded, 2 of them much larger, about ½ an in. broad by 4 lin. long; petals about ½ an in. long, almost orbicular, free; filaments very long, glabrous; berries the size of a small apple, almost globose, contracted in a very short stalk at the base, white, smooth and glossy, crowned by the spreading calyx-lobes, 2-celled, with a large seed in each cell, the endocarp rather thin, insipid-fleshy.

Hab.—In the tropical forests of Chittagong and Upper Tenasserim.—Fl. Fr. March.

Remarks.—Wood heavy, uniformly brown, close-grained, takes a fine polish.

○○ *Calyx-lobes in fruit incurved or inflexed.*

30. **E. macrocarpa,** Roxb.—An evergreen tree (25—30 + 8—12 + 2—3), all parts glabrous, the branchlets brown, compressed; bark smooth, grey, 2 lin. thick; cut pale-coloured; leaves more or less oblong, rounded or almost cordate at the base, on a thick petiole 2-4 lin. long, shortly but sharply acuminate, ⅔ to 1¼ feet long, thin coriaceous, entire, glabrous, rather opaque, the lateral nerves numerous and rather crowded, but rather irregularly parallel, thin but prominent, uniting towards the margin in a thin prominent marginal nerve; flowers large, pale rose-coloured or white, solitary or by threes, on a very short nipple-shaped pedicel, forming a short, simple or more usually corymb-like, sessile or almost sessile, glabrous raceme at the end of the branches; calyx 1-1¼ in. long, clavate-turbinate, much narrowed at the base, smooth (in a dried state almost sulcate), the persistent limb 4-lobed, the lobes semi-orbicular, rounded, 2 of them a little larger and nearly ⅓ in. long; petals 4, free, about an inch broad, reniform-orbicular, with a very broad base; filaments long and slender, glabrous; berries the size of an orange, almost globose, smooth, brown, several-seeded, crowned by the spreading calyx-lobes, the endocarp rather thin, fleshy, edible.

Hab.—Frequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban down to Tenasserim, up to 2,000 feet elevation.—Fl. March-Apr.; Fr. Aug.—s.—SS.=*Metam.* SiS.

Remarks.—Wood rather heavy, fibrous, but close-grained, pale brown.

31. **E. amplexicaulis,** Roxb.—An evergreen stately tree, with a tolerably straight trunk soon dividing, all parts glabrous; bark of woody parts brown; leaves oval-oblong, almost stem-clasping, rounded at both ends, firm and glossy, 6 to 8 in. long by 3-4 broad, the lateral nerves rather distant, not numerous, curved and arcuately anastomosing towards the margin; flowers large, white, sessile with a contracted calyx-base, by threes, on a very short peduncle, forming a short, small, stiff corymb laterally arising from above the scars of the fallen leaves; peduncle and ramifications very short and thick, joint-like; calyx turbinate, about ½ an in. long, smooth, contracted in a short pedicel-like base, the limb 4-lobed, persistent, the lobes rounded, 2 of them larger and about 3 lin. long; petals 4, free, obovate-orbicular, nearly ½ an in. long; filaments long and slender, glabrous; berry globular, the size of a small apple, greenish yellow when ripe, crowned by the inflexed calyx-lobes, 1- or 2-seeded, the endocarp soft and rather spongy.—(Descript. from Roxburgh's Fl. Ind. and his MS. drawings.)

Hab.—Chittagong.

32. **E. Malaccensis,** L.—*Thabyoo-thabyay.*—An evergreen tree, 30 to 40 ft. high, all parts glabrous, the branchlets compressed-terete, pale-brown; leaves oblong-lanceolate to almost obovate-lanceolate, acuminate at the base, on a ⅓ to ½ in. long, strong petiole, acuminate, 6-8 in. long, chartaceous, entire, glabrous, opaque, the lateral nerves rather numerous, thin but prominent, irregularly parallel and almost curved, anastomosing towards the margin, indistinctly and laxly net-veined between; flowers large, purple, sessile, on a very shortened peduncle and appearing almost clustered; calyx about ½ an in. long, clavate-turbinate, smooth, narrowed at the base, the persistent limb 4-lobed, the lobes semi-orbicular, the 2 larger ones about 3 lin. broad or somewhat broader; petals 4, free, almost reniform-orbicular with a broad base, about ½ in. long; berries about the size of a hen's egg, obversely ovoid-turbinate to elliptically-ovoid, smooth and glossy, from pale rose-coloured to dark purple, crowned by the inflexed calyx-lobes, usually 1-seeded, the endocarp thick and fleshy, edible.

Hab.—Cultivated in native gardens of Tenasserim.—Fl. H.S.

33. **E. polypetala,** Wall.—An evergreen tree (20—30+4—6+3—4), all parts glabrous, the branchlets whitish and scared; leaves often whorled by 3 or 4, or opposite or nearly so, linear to linear-lanceolate, acuminate or obtuse at the base, on a thick hardly a

line long petiole, 3-4 in. long, bluntish acuminate, entire, glabrous, thin coriaceous, opaque, the lateral nerves thin but prominent, rather distant, anastomosing towards the margin, thinly veined between; flowers rather large, white, on slender ½-1½ in. long at the apex minutely 2-bracteoled pedicels, forming a simple corymb or a short, glabrous, short-peduncled, corymb-like raceme arising solitary from above the scars of the fallen leaves; calyx obconically turbinate, about ½ in. long, smooth, clavate-contracted at the base, the limb 4-lobed, the lobes persistent, 2 of them very much larger and broader, about 2 lin. long by 4 broad, rounded; petals 4-16, broader than long, free; filaments long and slender, glabrous.

Hab.—Chittagong.—Fl. March-Apr.; Fr. June and July.

34. **E. aquea,** Burm.; Bedd. Sylv. Madr. 109.—An evergreen tree (20—30+10—12+2—3), all parts glabrous, the branchlets white or pale-coloured, sharply and often wingedly 4-angular or terete or nearly so; leaves variable, those of the shoots often elongate oblong-linear, up to a foot long and of a thinner texture, the older ones oblong to ovate-oblong, rounded or almost cordate at the usually narrowed base, on a very thick about a line long petiole, ½-1 ft. long, longer or shorter bluntish acuminate, entire, chartaceous to coriaceous, glabrous, the lateral nerves thin but prominent, somewhat irregularly parallel and rather copious, at about 1-2½ lin. from the margin united into a continuous marginal nerve as strong as the nerves themselves; flowers large, white, on a short ¼ to ½ in. long pedicel, solitary or by threes, forming a short, simple or almost corymb-like, glabrous raceme at the end of the branches or occasionally in the axils of the leaves; calyx about ½-¾ in. long, turbinate-clavate, smooth, the limb 4-lobed, the lobes persistent, twice as broad as long, blunt, 2 of them larger, about 5 lin. broad; petals 4, broader than long, rounded, free; filaments long and slender, glabrous; berries depressed-turbinate-pear-shaped, smooth and glossy, pale rose-coloured or white, the size of a wood-apple, 1-4-seeded, with several abortive seeds, crowned by the inflexed carnescent calyx-lobes, the endocarp spongy-fleshy, thick, edible.

Hab.—Apparently only cultivated all over Burma from Chittagong and Martaban down to Tenasserim.—Fl. March-Apr.; Fr. May-June.

35. **E. Javanica,** Lamk.—An evergreen tree (25—30+10—12+3—4), all parts glabrous, the branchlets terete and brown; leaves from ovate-oblong to oblong-lanceolate, rounded to almost cordate at the base, on a short petiole up to a line long or almost sessile, bluntish to bluntish acuminate, 4-6 in. long, entire, thin coriaceous, glabrous, the lateral nerves thin and rather faint, rather copious and somewhat irregularly parallel, faintly anastomosing towards

the margin; flowers large, white, either solitary on a slender peduncle or usually by 2 or 3, sessile, with a pedicel-like base or really shortly jointed-pedicelled, forming a lax, rather short, glabrous, often corymb-like raceme at the end of the branches or laterally from above the scars of the fallen leaves; calyx clavate-turbinate, narrowed into a short pedicel-like base, smooth, about ⅓-½ in. long, the limb persistently 4-lobed, the lobes broader than long, rounded, 2 of them somewhat larger and about 3 lin. broad; petals 4, free, obovate-orbicular, about ⅓ in. long or longer; filaments long and slender, glabrous; berries depressed-turbinate, contracted in a very short stalk, the size of a cherry to that of a wood-apple, white, glossy and smooth, crowned by the carnescent incurved calyx-lobes, usually 1- or few-seeded, the endocarp spongy-fleshy, thick, edible.

Hab.—Frequent in the evergreen coast-forests of the Andamans.—Fl. March-Apr.; Fr. May-June.—s.—S.S. = Aren. SiS.

36. **E. Jambos,** L.; Brand. For. Fl. 233.—An evergreen tree (20—30 + 3—5 + 3—4), all parts glabrous, the branchlets more or less 4-cornered, pale brown; leaves lanceolate, acute at the base, on a strong petiole 2-3 lin. long, bluntish and rather long acuminate, 4-6 in. long, coriaceous, glabrous, the lateral nerves thin but prominent, rather copious and irregularly parallel, laxly and thinly net-veined between; flowers large, white, on about ½ in. long or somewhat shorter pedicels, forming a short, glabrous, simple corymb-like raceme at the end of the branchlets; calyx about ½ an in. long or longer, clavate-turbinate, smooth, clavately narrowed at the base, the limb 4-lobed, the lobes almost equal, broad, rounded, about 2-3 lin. long, persistent; petals 4, obovate-orbicular, about ½ an in. long, free; filaments very long, glabrous; berries almost globular or ovoid, dull yellow, smooth, thick-fleshy, edible, crowned by the inflexed calyx-lobes, 1- or 2-seeded.

Hab.—Frequently cultivated in native gardens all over Burma.—Fl. May-July; Fr. C.S.

BARRINGTONIA, Forst.

Calyx-tube ovoid or turbinate, not or hardly produced beyond the ovary, the limb valvately rupturing into 2-4 lobes, or 3-4- (very rarely 5-) cleft, with the lobes imbricate in bud. Petals 4, rarely 5, at the base adnate to the staminal cup. Stamens indefinite, in several rows, at the base united in a cup or ring, all bearing anthers; filaments filiform; anthers versatile or almost basifix. Disk annular. Ovary inferior, 2-4-celled, with 2 to 8 suspended or horizontal superposed ovules in each cell arranged in 2 rows; style filiform with a small stigma. Berry fibrous-fleshy, terete or angular, crowned by the calyx-limb, by abortion usually 1-seeded.

Embryo thick and fleshy, entire, consisting of a woody rind and a medullary stratum.—Trees, with alternate, penninerved, not dotted leaves. Flowers usually large, in terminal or lateral racemes or spikes. Bracts very deciduous, usually small.

* *Calyx in bud closed, entire, valvately rupturing in 2-4 lobes. Flowers pedicelled.*

× *Fruit with appendages, angular.*

Flowers about 3 in. in diameter or larger, in corymb-like, short, erect racemes; leaves entire, sessile . . . . . *B. speciosa.*

Flowers about an in. in diameter, in long, slender, pendulous racemes; leaves crenulate, very shortly petioled . . . *B. racemosa.*

×× *Fruit conically pyramidal, with short wing-like appendages at the base.*

Leaves crenulate; racemes rather erect, puberulous . . . *B. conoidea.*

* * *Calyx already in bud 3-4-cleft, the lobes imbricate.*

× *Flower pedicelled; rachis of raceme slender; fruits sharply 4-cornered.*

Glabrous or slightly pubescent; flowers red, rather small; leaves crenulate, short petioled . . . . . *B. acutangula.*

×× *Flowers sessile, the rachis of the spike very thick and almost fleshy.*

\+ *Calyx-tube winged; fruits narrowly winged along the corners.*

Leaves blunt or acute at the base, not decurrent; calyx-lobes rounded, 2 lin. long . . . . . *B. augusta.*

Leaves long-decurrent and acuminate at the base; calyx-lobes 3-angular-ovate, more or less acute, more than 3 lin. long . *B. pterocarpa.*

\+ \+ *Calyx-tube not winged (fruits unknown).*

Leaves entire, elongate, long-petioled . . . . . *B. macrostachya.*

Leaves elongate, long-petioled; flowers pedicelled; calyx terete . *B. pendula.*

1. **B. speciosa,** L.f.; Bedd. Sylv. Madr. 112.—*Kyè-kyee.*—An evergreen tree (30—50 + 6—15 + 4—8), all parts glabrous; leaves large, obovate-cuneate, sessile, with a narrowed rounded base, blunt to almost retuse, 1-2 ft. long, thick membranous or thin coriaceous, entire, glabrous and glossy; flowers conspicuous, up to 3 in. in diameter, white, on a 1-2 in. long pedicel, forming a shorter or longer terminal corymb-like raceme furnished with diminutive floral leaves passing into bracts; calyx-limb valvately 2-3-cleft, the lobes concave-elliptical, veined; petals about 1½ in. long; ovary 4-celled, 2 of the dissepiments often imperfect in the middle; fruit as large as the fist, turbinate-pyramidal, 4-angular, fibrous-fleshy, the endocarp putamen-like.

Hab.—Frequent along the sea-shore of the Andamans.

2. **B. racemosa,** DC.; Bedd. Sylv. Madr. 112.—*Kyee-pen.*—An evergreen tree (40—50 + 20—25 + 4—5), all parts glabrous; leaves more or less cuneate-oblong to cuneate-lanceolate, rounded or obtuse at the narrowed base, on a short petiole 2-3 lin. long, shortly acuminate, crenulate, chartaceous, 4-8 in. long, glabrous; flowers conspicuous, white or pale rose-coloured, on slender 2 to 3 lin. long pedicels, forming a long, pendulous, quite glabrous, slender raceme

arising laterally from the end of the branchlets; calyx-tube turbinate, obsoletely 4-angular, quite smooth, the limb valvately rupturing into 2 or 3 concave, blunt, smooth lobes more than $\frac{1}{3}$ in. long; petals ovate-oblong; fruit fibrous-fleshy, ovoid-oblong, 4-cornered, about $1\frac{1}{2}$ in. long, crowned by the calyx-limb, 1-seeded.

HAB.—Frequent in the evergreen coast forests of the Andamans.—Fl. Apr.; Fr. May-June.—s.—SS.=SiS. Chloritic rocks, etc.

3. **B. conoidea,** Griff.—An evergreen shrub or small tree, all parts glabrous; leaves more or less cuneate-oblong, rounded or cordate at the narrowed base, acute or shortly acuminate, on a thick 1-2 lin. long petiole, 6-8 in. long, crenate-serrulate, chartaceous, glabrous; flowers conspicuous, on slender about $\frac{1}{2}$ an inch long pedicels, forming a rather short, erect, somewhat puberulous raceme arising laterally or from the end of the branchlets; calyx-tube about 2 lin. long, obsoletely pulverulent, conical, at the base produced into 8 thickened protuberances, the limb valvately rupturing into 2 concave-oblong, acute, $\frac{1}{3}$-$\frac{3}{5}$ in. long lobes; petals ovate-lanceolate, berries fibrous-fleshy, conoid, the size of a hen's egg, crowned by the calyx-limb, at the base produced into 8 wing-like semicordate processes (or all or the one or other of these expanded into larger, recurved, oblong, fleshy wings ?), 1-seeded.

HAB.—Coast forests of Upper Tenasserim.—Fl. Apr.

4. **B. acutangula,** Gaertn.; Bedd. Sylv. Madr. t. 204; Brand. For. Fl. 235.—*Kyay-nee.*—An evergreen tree (40—50 + 10—25 + 5—6), all parts glabrous or the shoots and under-surface of leaves puberulous; bark dark brown, rough, thick; leaves obovate to obovate-oblong, acuminate to almost cuneate-acuminate at the base, on a short puberulous or glabrous petiole 1-2 lin. long, apiculate or blunt to rounded at the apex, crenate-serrulate, chartaceous, 2-3 in. long, glabrous, or usually minutely greyish pubescent beneath, conspicuously net-veined and pale coloured beneath; flowers rather small, but conspicuous by the long red filaments, on rather slender about a line long pedicels, forming a slender, long, puberulous, soon glabrescent raceme at the end of the branchlets; calyx glabrous, the tube short, sharply 4-cornered, the limb 4-lobed, the lobes almost semiorbicular to oblong and blunt, about a line long or somewhat longer; petals 4, oblong, flesh-coloured, about 3 lin. long; fruits oblong, up to $1\frac{1}{2}$ in. long, sharply 4-cornered, glabrous, crowned by the small calyx-limb, 1-seeded.

HAB.—Common in the mixed, especially the lower and savannah, and swamp forests all over Burma from Chittagong and Ava down to Tenasserim; prefers swampy localities.—Fl. Apr.-May; Fr. June and July.—l×s.—SS.=SiS. *All.*

REMARKS.—Wood red-brown, hard, fine-grained, used in constructing carts; bark good for tanning.

5. **B. pterocarpa,** Kz.—*Kyè-tha.*—An evergreen tree (30—50 +12—20+4—6), all parts glabrous; leaves elongate ovate-lanceolate, long cuneate-acuminate at the base and decurrent on the longer (up to ½ in. long) or shorter petiole, shortly acuminate, 1-1¼ ft. long, crenulate-serrate towards the apex, thin coriaceous, glabrous; flowers conspicuous, white or rose-coloured (the filaments white), sessile, forming a very long, pendulous, thick-spindled, pulverulent spike at the end of the branchlets furnished at the base with reduced lanceolate crowded floral leaves; calyx velvety, the tube about a line long or longer, wingedly 4-cornered, the limb 4-cleft, the lobes triangular-ovate, acute or bluntish, more than 3 lin. long; petals ⅔ in. long, ovate-oblong, acute; fruits oblong, fibrous-fleshy, about 2 in. long, 4-cornered, the angles narrowly and thick-winged.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah, and more so in those of Martaban.—Fl. March-April; Fr. June.—s.—SS.=SiS. Metam. Lat. p.

6. **B. augusta,** Kz.—An evergreen middling-sized tree, all parts glabrous; leaves cuneate-oblong to ovate-cuneate, obtuse or acute at the base, on a thick petiole 3-4 lin. long, acute or shortly acuminate, ½-1¼ ft. long, crenulate-serrate, almost entire towards the narrowed base, chartaceous, glabrous; flowers conspicuous, sessile, forming a very long, thick-spindled, tawny puberulous spike at the end of the branchlets furnished at its base with numerous crowded lanceolate reduced leaflets; calyx velvety, the tube about a line long or longer, wingedly 4-cornered, the limb 4-cleft, the lobes rotundate, 2 lin. long; fruits (unripe) fibrous-fleshy, oblong, tawny pulverulent, crowned by the calyx-limb, 4-winged, the wings fleshy and thick, rather narrow, waved.

Hab.—Upper Tenasserim.—Fl.-Feb.

7. **B. macrostachya,** Kz.—An evergreen small tree, all parts glabrous, the bark grey; leaves elongate-oblong-lanceolate to obovate-oblong, long-acuminate at the base, on a rather slender petiole an inch long or longer, shortly acuminate or apiculate, entire, 1-1¼ ft. long, chartaceous, glabrous; flowers conspicuous, purplish red, with white, long filaments, sessile, forming lateral, long, pendulous, thick, cylindrical, somewhat pulverulent spikes; calyx-tube about 3 lin. long, obconical, 4-cornered, the limb valvately 4-lobed, the lobes about 2 lin. long, rounded and blunt, pulverulent outside; petals ovate, blunt; fruit (accord. Jack) a berry or apple.

Hab.—Forests of Southern Tenasserim.

8. **B. pendula,** Kz.—A small tree; leaves lanceolate-oblong, narrowed at both ends, long-petioled, one foot long or longer,

almost serrulate; spikes up to 2½ ft. long, arising from the older branches, sulcate, densely flowered; flowers large; calyx almost obovate, the limb 4-cleft, the lobes rotundate, erect, persistent; 4-celled.—(After Griffith.)

HAB.—Tenasserim.

CAREYA, Roxb.

Calyx-tube thick, ovoid or turbinate, not produced beyond the ovary, the limb deeply 4- or 5-lobed. Petals 4, or rarely 5. Stamens numerous, in several series, quite free, the outermost longer ones or the innermost shorter ones or both reduced to filiform staminodes, the median ones or nearly all perfect; anthers small. Ovary inferior, 4- or rarely 5-celled, with several ovules in 2 to 6 rows in each cell; style elongate, with a somewhat capitate or slightly 4-lobed stigma. Fruit globose, fleshy, crowded by the calyx-limb, many-seeded. Seeds funicled, irregularly scattered and enveloped in a fleshy pulp. Embryo entire; cotyledons none.—Trees or rarely undershrubs, with alternate, not dotted leaves, often crowded. Flowers large and showy, in short interrupted spikes or racemes.

* *Flowers on long pedicels.*

Undershrub; berry only an inch thick; seeds about 3 lin. long . *C. herbacea.*

* * *Flowers sessile. Trees.*

Petals blunt or rounded at apex, concave; ovules in 2 rows in each cell . . . . . *C. arborea.*

Petals acute, the borders revolute. Ovules in 6 rows in each cell . *C. sphærica.*

1. **C. arborea,** Roxb.; Bedd. Sylv. Madr. t. 205 and Anal. t. 19, f. 2.; Brand. For. Fl. 236.—*Ban-bway.*—A tree (50—60+12—20+5—8), remaining stunted in sterile grounds, shedding leaves during H.S., all parts glabrous; leaves obovate, while young sessile with a decurrent base, afterwards shortly and thick-petioled, shortly apiculate, ½-1 ft. long, crenate-serrulate, chartaceous, glabrous; flowers large, nearly 2½ in. in diameter, white, with purple filaments, sessile, each supported by 3 unequal bracts and forming a short almost cluster-like spike at the end of the branches; calyx pruinous, the tube hemispherically ovoid, nearly ½ an inch long, the lobes ⅓ in. long, leathery, rounded; petals oblong, concave (not revolute), 1¼ in. long, rounded or blunt; outer series of stamens much longer and reduced to filaments, the median ones fertile, the innermost ones much shorter and converging; ovary-cells with only 2 vertical rows of seeds; berry ovoid or globose, the size of a large apple, smooth, crowned by the calyx-limb; seeds oblong, somewhat compressed, ½ in. long, the testa pale brown, thin coriaceous, smooth.

HAB.—Common in all leaf-shedding forests, especially in the open, dry, lower mixed and savannah forests, all over Burma from Pegu and Martaban down to Tenasserim.—Fl. Apr.-May; Fr. June-July—l.—SS.=∞.

Remarks.—Wood heavy, red-brown, close and even-grained, tough, strong and durable, takes fine polish. W = □′ = 55 pd. Used for gun-stocks, house-posts, planks, cart-framing, &c. Also good for furniture and cabinet-working, but too heavy. Bark used for tanning.

2. **C. sphærica,** Roxb.—A leaf-shedding large tree; leaves broadly obovate, cuneate-acuminate at the base, shortly petioled, ½-1 ft. long, apiculate, blunt or almost retuse, obsoletely crenate, chartaceous, glabrous; flowers white, with the outer filaments purple, large, up to 2½ in. across, sessile, each supported by 3 rather large bracts and forming a short cluster-like spike at the end of the thick often reduced branches; calyx pruinous, the tube about ⅓ in. long, hemispherical, the limb 4- rarely 5-cleft, the lobes only 2 lin. long, rounded, thick; petals 4, rarely 5, oblong-lanceolate, 1¼ in. long, bluntish, but appearing acute through the revolution of their margins; outer stamens much longer, reduced to filaments, median ones fertile, innermost ones short, sterile and converging; ovary-cells with 6 vertical rows of ovules; berry spherical, the size of an orange, fibrous-fleshy, smooth, crowned by the calyx-limb; seeds oblong, pale brown, somewhat compressed, smooth, about ½ in. long.

Hab.—Mountains of Chittagong.—Fl. Apr.; Fr. July.

PLANCHONIA, Bl.

Calyx-tube turbinate, hardly or not produced beyond the ovary, the limb 4-cleft, imbricate in bud. Petals 4. Stamens numerous, in many rows, united at the base in a ring or short cup, the innermost series without anthers. Ovary crowned with an epigynous ring surrounding the style, 3-4-celled, with numerous ovules in 2 rows in each cell; style filiform with a blunt cruciately depressed stigma. Berry corticate, crowned by the calyx-limb, 3-4-celled. Seeds several in each cell, long-funicled. Albumen none. Embryo circinate, the cotyledons short, foliaceous, folded, the radicle very long, clavate, spirally convolute.—Trees, with alternate or crowded, not dotted leaves. Flowers rather small, 3-bracted at the base, in very short terminal racemes.

1. **P. valida,** Bl.—*Ban-bway.*—An evergreen tree (40—60 + 15—20 + 4—10), all parts glabrous; leaves obovate to elliptically oblong, at the sinuate-acute base decurrent on the broad petiole of variable length (¼-¾ in.), thick chartaceous or thin coriaceous, 3-7 in. long, crenulate-serrate, glabrous, much and laxly net-veined, glossy, especially beneath; flowers middling sized, greenish, on very short thick pedicels, forming a short terminal raceme; calyx almost turbinate, obsoletely 8-cornered, about ¼ in. long, the lobes as long,

almost semi-orbicular; petals reflexed, about an inch long, blunt; filaments purple, twisted, 1½ in. long.

HAB.—Frequent in the evergreen coast-forests of the Andamans.—s.—SS.=SiS.

REMARKS.—Wood brown, close-grained, heavy, the sap-wood lighter coloured.

MELASTOMACEÆ.

Flowers regular, hermaphrodite. Calyx-tube enclosing the ovary, and either cohering with its angles, leaving intermediate cavities, or entirely free or more or less adnate to it; limb entire or 3-6-lobed or -toothed, usually imbricate in bud. Petals 3-5, rarely 6, imbricate (usually contorted). Stamens usually twice as many, sometimes only as many as petals and inserted with them, the filaments curved down in the bud; anthers 2-celled, opening in 1 or 2 pores at the top or very rarely dehiscing longitudinally, the connective often variously extended or thickened. Ovary enclosed in the calyx-tube and adnate to it, or more or less free, with 2 to 6 or rarely more cells, with the placenta in the axis, or rarely 1-celled by the abortion of the partitions; style simple, with a minute stigma. Ovules several, rarely 2 only to each placenta, anatropous. Fruit enclosed in the calyx or combined with it, a berry or a capsule opening in as many valves as there are cells, usually many- rarely few- or 1-seeded. Albumen none. Embryo straight or curved, the cotyledons plano-convex or thick and variously folded; radicle short.—Herbs or shrubs, very rarely trees, with opposite, simple, 3-11 (very rarely 1-nerved and penninerved) -nerved leaves. Stipules none. Flowers often gay coloured, usually in terminal panicles or clusters, rarely axillary or solitary.

An order of little interest to the forester. Slightly astringent principles prevail, and the numerous species of *Memecyla* furnish welloy dye. The timber, too, of these is very hard, but small. Upwards of 36 species are found in Burma.

* *Anthers opening by* 2 *or* 1 *apical pores. Embryo small, terete or nearly globose.*

× Ovary more or less adnate to the calyx, the apex free, conical or convex. Connective usually produced beyond the base of the anthers. Seeds cochleate, minute.

Anthers equal; fruit a berry . . . . . *Otanthera.*

Anthers almost unequal; fruit a berry . . . . . *Melastoma.*

× × Ovary free or more or less adnate to the calyx, the apex free, hemispherical or conical, sometimes carved out. Connective not produced beyond the base of the anther. Seeds minute, never cochleate.

○ Calyx terete and smooth, adnate to the ovary and capsule; anthers 10, equal . . . . *Ochthocharis.*

○ ○ Calyx ribbed.

Ovary and capsule high-up adnate to the calyx; panicle terminal . *Oxyspora.*

Ovary and capsule free on the bottom of the calyx; panicle terminal . . . . . *Allomorphia.*
As former, but flowers in axillary clusters . . . . . *Anerincleistus.*
× × × Ovary wholly or only with its angles adnate to the calyx, the free apex conical or convex. Stamens nearly equal or the alternating ones reduced to curiously-shaped staminodes; anthers usually recurved. Seeds never cochleate.
Stamens inserted in the deep grooves between the ovary and calyx; connective at base in front with 2 bristles, lobes, or tubercles.
Ovary crowned by 4 crests; panicle terminal . . . *Anplectrum.*
∗ ∗ *Anthers opening by longitudinal slits.*
Ovary 4-celled; seeds numerous, minute; embryo minute . . *Pternandra.*
Ovary 1-celled; seeds solitary; embryo large . . . . *Memecylon.*

OTANTHERA, Bl.

Calyx hirsute or covered with tufted stiff hairs, the tube ovoid; lobes 5 or 6, deciduous, with or without accessory teeth or scales. Stamens twice as many as petals, all equal and conform; anthers oblong-linear or linear-subulate, opening by a single apical pore, the connective not prolonged beyond the anthers, but at the base produced in a short, 2-lobed or 2-spurred appendage turned upon the inner face. Ovary half-inferior, 5-6-celled, crowned with bristles; style thickened upwards, the stigma truncate. Fruiting calyx truncate, the berry 5-or 6-celled, more or less pulpy, irregularly rupturing. Seeds minute, cochleate.—More or less strigose herbs with 3- to 7-nerved leaves. Flowers in terminal trichotomous cymes or panicles.

1. **O. bracteata**, Korth. — An evergreen shrubby plant, the branches 4-cornered and more or less covered with pale-coloured or reddish hairs or bristles; leaves from lanceolate to elliptically ovate, on an appressed bristly petiole 2-4 lin. long, acuminate, entire, membranous, usually 5-nerved, on both sides rough from appressed strigose hairs, 3 to 5 in. long; flowers rather conspicuous, white or pink, on 1-2 lin. long, densely appressed, hispid pedicels, forming a poor terminal very shortly peduncled or almost sessile cyme usually supported by a few bract-like floral leaves; calyx-tube nearly 3 lin. long, more or less densely covered with scales formed of 1 to 5 long, pale or purplish bristles thickened at the base; lobes 5 or 6, linear, hardly as long as the tube, long and bristly ciliate, alternating with as many minute, obtuse, stellately-fringed scales; petals 6-8 lin. long, obovate, terminating in a tuft of long stiff hairs; ovary 4- or 5-celled, the conical apex densely appressed hirsute; fruiting calyx almost globular, with a short, free, truncate tube, bristly, the berry rather dry, as large as a pea, with thick fleshy placentas projecting far into the cells.

Hab.—Not unfrequent in Tenasserim from Moulmein down to Mergui.—Fl. Feb.-July.

MELASTOMA, L.

Calyx clothed with bristles or scales, the tube bell-shaped or ovoid; lobes 5, rarely 6 or 7, deciduous, alternating with as many inconspicuous accessory lobes or teeth. Petals usually 5. Stamens twice as many as calyx-lobes; anthers linear-subulate, opening by a single apical pore, very unequal, 5 larger with the connective produced below in a long appendage, incurved and 2-lobed or 2-pointed at the insertion of the curved filaments, and 5 smaller with the basal appendage shorter or wanting. Ovary ovoid, free, or more or less adnate, 5- rarely 6- or 7-celled, the apex appressed bristly; style filiform with an obtuse stigma. Fruiting calyx-tube truncate after the fall of the lobes, more or less adnate to the more or less succulent and pulpy irregularly bursting berry. Seeds minute, cochleate.—Shrubs or little trees, with 3- or more-nerved leaves. Flowers conspicuous, solitary, or forming poor terminal cymes.

× Leaves more or less appressed bristly hairy or pubescent.
+ Calyx covered with closely appressed, chaffy, scale-like bristles.
Scales of calyx about ⅓ lin. long or longer, often rather broad; calycine lobes shorter, often only half as long as the calyx-tube; leaves usually acute and appressed bristly on both sides *M. malabathricum.*

Scales of calyx up to a line long, chaffy, ciliate or finely cleft; calyx-lobes about as long as the tube, acuminate, the alternating teeth short and subulate; leaves on both sides, or only beneath, appressed pubescent, acuminate . . . . *M. normale.*
++ Calyx covered with squarrose scale-like bristles about 2 lin. long and more or less spreading.
Leaves softly appressed-pubescent on both sides . . . *M. Houtteanum.*
×× Leaves glabrous, or only with a few scales on the ribs beneath.
Calyx covered with long, fine, spreading bristles curved upwards; the accessory teeth nearly as long as the calyx-lobes . . *M. decemfidum.*

1. **M. malabathricum,** L.—*Myet-pyai.*—An evergreen erect branched shrub from 1 to 6 ft. high, sometimes growing out into a little tree, all parts appressed bristly, the bristles on the branches often very rigid and scale-like; leaves on shorter or longer petioles, from ovate-oblong to elliptically oblong, rounded or obtuse at the base, usually 5-nerved (the 2 intra-marginal nerves thin), acute, 3 to 5 in. long, covered by appressed hairs or bristles, which are either rigid and strigose on the upper side and softer beneath, or as often rigid and scale-like on both sides; flowers usually 5-merous, conspicuous, rose-coloured, purple or white, on 3 to 4 lin. long scaly pedicels, forming by 3 to 11 terminal almost sessile cymes; bracts very deciduous, from large and broadly ovate to small and narrow-lanceolate; calyx-tube ovoid-globose, 2 to 3 lin.

long, densely covered with short appressed-chaffy scales, the lobes lanceolate, more or less acuminate, usually shorter than the tube, alternating with the 5 small subulate scales or accessory lobes; petals ½ to ¾ in. long, obovate; connective of the shorter stamens at the base excurrent into 2 lobes; berry enclosed and adnate to the appressed-chaffy calyx, globular, 3 to 4 lin. in diameter; seeds minute, attached to the thick pulpy purple placentas.

Hab.—Frequent all over Burma from Chittagong and Ava down to Tenasserim, especially in shrubby waste places, in savannahs, along river embankments, etc.—Fl. Fr. ∞.—s. × l.—SS. = ∞.

2. **M. normale,** Don.—An evergreen shrub often growing out into a treelet of 10 to 12 ft. in height, the branches conspicuously rufous-hirsute; leaves from elliptically ovate to linear-oblong, on strigose rather short petioles, acuminate, 3-5 in. long, above covered with appressed, short, rather roughish, stiff hairs, beneath densely and softly pubescent; flowers showy, rose-coloured or white, on short hirsute pedicels, forming small, almost sessile cymes at the end of the branchlets; calyx densely covered with appressed-chaffy ciliate or finely cleft scales up to a line long, the lobes about as long as the calyx-tube, ovate to lanceolate, acuminate, alternating with as many short subulate teeth; petals obovate, about a line long.

Hab.—Frequent in the drier hill forests of Martaban, up to 5000 ft. elevation; Ava hills.—Fl. March-May.—SS.=Metam, Lat.

3. **M. Houtteanum,** Naud.—An evergreen bushy shrub, the branches more or less covered with pale-coloured or brown bristly scales and stiff hairs; leaves on shorter or longer chaffy-scaled petioles, varying from oblong to oblong-lanceolate or almost ovate, rounded at the base, 3-5 in. long, acuminate or acute, entire, appressed-bristly and rough above, beneath usually softly appressed-pubescent and chaffy along the 5 principal nerves; flowers conspicuous, usually 5- occasionally 6-merous, purple or pink, on short appressed scaly pedicels, forming by 3 or more an almost sessile terminal cyme or rarely solitary; bracts at the base of the pedicels varying from oblong to lanceolate, shorter or longer; calyx thickly covered with closely appressed afterwards somewhat spreading, long, chaffy, ciliate, pale-coloured scales of about 2 lin. length; the lobes linear-lanceolate, subulate-acuminate, nearly as long as the calyx-tube, appressed pubescent, alternating with as many short linear accessory teeth terminated by a tuft of bristles; petals obovate, ciliolate, bearing a tuft of hairs at the apex, about ¾ to 1 in. long; connective of shorter stamens with 2 basal appendages.

Hab.—Rather rare in the tropical forests along the eastern slopes of the Pegu Yomah; Tenasserim.—Fl. March—s.—SS.=SiS.

OXYSPORA, DC.

Calyx glabrous, the tube oblong or clavate-bell-shaped, obsoletely 4-cornered; lobes 4, short, simple, or augmented on the back with a minute tooth or wing-like appendage. Petals 4. Stamens 8, 4 of which usually smaller, or rarely only 4, dimorphous, the 4 larger ones purple, curved, opening by a single apical pore, rather long, 2-lobed at the base, the smaller ones yellow; connective not produced, without appendages, but usually spurred on the back. Ovary high up adnate with the angles of the calyx, 4-celled, glabrous at the apex; style filiform, with a punctiform stigma. Capsule club-shaped, enclosed in the membranous 8-ribbed calyx, 4-celled. Seeds numerous, minute, unequally cuneate.—Slender, erect or somewhat scandent shrubs, with 5- to 7-nerved leaves. Flowers rather small, forming terminal often drooping lax panicles.

Glabrous; ramifications of panicle 4-cornered or winged; bracts, etc., persistent; connective without appendage or spur . *O. cernua.*
Stems and petioles often hairy; panicle-branchings terete; bracts very deciduous; connective on the back side spurred at the base . . . . . *O. vagans.*

1. **O. cernua,** Hf. and Th.—An evergreen scandent shrub, all parts glabrous; leaves from ovate-lanceolate to ovate-oblong, shorter or longer petioled, acuminate, variable in size, the smaller ones 4 to 6, the larger 9 in. to a foot and more long, 5-nerved and regularly transversely parallel-veined, glabrous, pale coloured (in a dried state brown) beneath; flowers middling sized, rose-coloured, 4-merous, slenderly pedicelled, usually by 3-1 and cymulose, forming ample, lax, drooping, glabrous, compound panicles with the branchings and axis 4-cornered, or the latter often narrowly 4-winged towards the base; bracts and bractlets small, but persistent; calyx about 4 lin. long, glabrous, the tube obsoletely ribbed, the limb rather broad, 4-lobed, the lobes broadly ovate, acute; petals nearly ½ in. long, oblong, acute; stamens 8, the connective without appendages or dorsal spurs; capsule enclosed in the strongly 8-ribbed calyx-tube, about 3 to 4 lin. long, club-shaped, oblong, glabrous.

Hab.—Chittagong.—Fl. Oct.-Nov.; Fr. Feb.-March.

ALLOMORPHIA, Bl.

Calyx glabrous or sparingly hispid, the tube shortly bell-shaped or cylindrical, angular, the limb dilated, bluntish 4- or 5-toothed and persistent. Petals 4 or 5. Stamens 8 or 10, nearly equal; anthers incurved, 2-lobed at the base, opening by a single apical pore, the connective not produced and often spurred on the back at

the base. Ovary ovoid, almost free or only at the base adnate, situated on the bottom of the calyx, 3-4-celled, depressed on the swollen apex, usually ciliolate on the margin; style filiform, with a minute stigma. Capsule small, ovoid, enclosed in the urceolate 4-8-ribbed calyx-tube, 3-4-valved. Seeds linear-club-shaped.—Branched shrubs or (scapigerous?) perennials with long-petioled 5-9-nerved leaves. Flowers pedicelled, clustered, forming terminal, usually narrow panicles.

Calyx shallowly sinuate-toothed; branches, petioles, and the 9 strong nerves beneath densely brownish bristly . . . . . *A. hispida.*
Calyx-lobes with a thick wing-like appendage on the back; all parts glabrous . . . . . *A. umbellulata.*

1. **A. hispiad,** Kz.—An evergreen undershrub, the branches and the strong 5 in. long petioles covered with tawny, spreading, long, stiff bristles; leaves large, ovate, slightly cordate at the base, long-petioled, shortly acuminate, 8-9 in. long, almost coriaceous, above sparingly, beneath on the veins and especially on the 9 principal nerves more densely, covered with long, brownish, stiff bristles; flowers 4-merous, small, on slender 2-3 lin. long pedicels, clustered, forming a narrow glabrous panicle; calyx 4-ribbed, with a few long bristles, shortly bell-shaped and spreading somewhat in the manner of *Memecylon,* minutely and shallowly sinuate-toothed; petals obovate, almost 2 lin. long; stamens 8; anthers and connective without any appendage; ovary on the bottom of the calyx free.

Hab.—Martaban.

2. **A. umbellulata,** H.f.—An evergreen shrub, 10 ft. high, all parts glabrous; leaves much resembling those of *A. exigua,* long-petioled, ovate-oblong to ovate-lanceolate, obtuse or cordate at the base, acuminate, 6-9 in. long, 5-nerved and transversely parallel-veined, glabrous; flowers 4-merous, on minutely puberulous pedicels, usually by 3 or fewer, forming a poor, long-peduncled, trichotomous, minutely puberulous, glabrescent, raceme-like panicle in the axils of the leaves and much shorter than them, the rachis 4-cornered; bracts deciduous; calyx nearly 3 lin. long, clavate-bell-shaped, minutely puberulous, obsoletely 4-cornered, 4-lobed, the lobes short, on the back furnished with a semicordate, blunt, rather thick wing-like appendage; petals oblong, acute; stamens 8, unequal, the 2 longest erect (not inflexed) in the bud; ovary 4-celled.

Hab.—Tenasserim, Mergui Archipelago.

ANERINCLEISTUS, Korth.

Calyx widely bell-shaped, hirsute, the limb 4-lobed, persistent. Petals 4, minute. Stamens 8, equal; anthers opening by a single

apical pore, the connective not produced at the base, shortly spurred behind. Ovary almost free, 4-celled, broadly carved out at the apex, 4-lobed, the style short, with a punctiform stigma. Capsule 4-valved on the carved-out apex, longer than the calyx. Seeds minute, obovoid-cuneate.—Shrubs or little trees, with 5-7-nerved leaves. Flowers small, usually in axillary or terminal clusters or umbellets.

Appressed pubescent . . . . . *A. Helferi.*
Spreadingly velvety-tomentose . . . . . *A. Griffithii.*

1. **A. Helferi,** H.f.—A shrub, the branchlets terete, covered with tawny appressed pubescence; leaves oblong to ovate-lanceolate, on a densely appressed, pubescent, tawny petiole 2-3 in. long, acute or obtuse at the base, acuminate, 5-8 in. long, 5-7-nerved, with parallel, transverse and curved veins, on both sides (more so beneath) softly appressed pubescent, membranous; flowers small, on very short, densely appressed-pubescent pedicels, forming axillary small clusters; calyx-tube $\frac{1}{6}$ in. long, hemispherical, strigose; anthers oblong, blunt, the connective neither appendaged nor spurred; ovary 4-scaled at the apex; capsule intrusely 4-valved at the apex, enclosed in the hemispherical villous calyx.

Hab.—Tenasserim or Andamans (?).

2. **A. Griffithii,** H.f.—Softly tomentose, the woody branches terete, along with the petioles and principal leaf-nerves densely and spreadingly rusty-velvety-tomentose; leaves and inflorescence as in *A. petiolatus* (*sic*), but the calyx very densely and spreadingly hirsute.—(Descr. after Triana.)

Hab.—Tenasserim, Mergui Archipelago.

OCHTHOCHARIS, Bl.

Calyx glabrous, the tube hemispherically bell-shaped or obovoid, terete, without ribs, the limb 5-toothed, persistent. Petals 5. Stamens 10, equal; anthers almost straight, opening by a single apical pore, the connective not produced, but at the base in front tubercled or spurred. Ovary adherent to the calyx-tube, 5-celled, glabrous on the swollen apex; style filiform, with a punctiform stigma. Capsule globular, enclosed in the membranous smooth calyx, 5-valved. Seeds minute, irregularly cuneate.—Erect, usually small shrubs, with 3- to 5-nerved leaves. Flowers minute, forming axillary clusters or short cymes, or rarely lax, axillary and terminal panicles.

1. **O. Javanica,** Bl.—An evergreen low-branched erect shrub, about 2 to 3 ft. high, all parts glabrous; leaves lanceolate to elliptically lanceolate, tapering at the base in a petiole $\frac{1}{3}$ to $\frac{3}{4}$ in. long, acuminate, 2-3 in. long, minutely and distantly bristly serrate,

glabrous, 3-nerved, with 2 faint intramarginal ones, the transverse parallel veins little visible; flowers very small, rose-coloured, on ½ to 1 lin. long bracteolate pedicels, forming short glabrous cymes in the axils of the leaves; bracts lanceolate, minute; calyx about a line long, glabrous, obsoletely ribbed; petals about as long as the calyx; capsules globular, the size of a small pea, enclosed in the smooth calyx.

Hab.—Tenasserim.

ANPLECTRUM, A. Gray.

Calyx-tube ovoid-globular, the limb truncate or obsoletely 4-toothed, the teeth alternating with as many punctiform teethlets. Petals 4. Stamens 8, very unequal; anthers alternately imperfect, the larger ones ovoid or oblong, opening by a single apical pore, the connective not produced, not appendaged, or 2-lamellate at the base or shortly spurred behind. Ovary free above, 4-celled, crowned with 4 crests; style filiform, with a punctiform stigma. Berry almost globose, crowned by the calyx-limb. Seeds numerous, wedge-shaped, angular.—Scandent shrubs, with 3-to 7-nerved leaves. Flowers small, in terminal and axillary panicles.

1. **A. cyanocarpa,** Triana.—An evergreen slender, half-scandent shrub, the branchlets and petioles above bristly-hairy, otherwise glabrous; leaves on a 2 to 4 lin. long petiole, ovate-oblong to ovate, sometimes slightly cordate at the base, 3-4 in. long, bluntish acuminate or apiculate, entire, thin chartaceous, glossy above, glabrous, or while young sparingly bristly hairy on the nerves beneath, 3-nerved, with 2 intramarginal nerves, transversely and rather distantly parallel-veined; flowers 4-merous, shortly pedicelled, cymose, forming a large, terminal, compound, but rather lax, glabrous panicle; bracts deciduous; calyx smooth, with the limb truncate and obscurely toothed, the tube ovoid-oblong, 2 lin. long; petals ovate, acute; fertile stamens 4, beaked, without any appendage; staminodes 4, alternating with the stamens, but sometimes the one or other quite abortive; filament broad, flat, terminating in a hastate-triangular at the apex usually 2-cleft membrane excurrent at the inner base into a bristle longer than the filament itself; berries ovoid, quite smooth, crowned by the narrow truncate calyx-limb.

Hab.—In the tropical forests of Tonkyeghat, Martaban; Tenasserim.

PTERNANDRA, Jack.

Calyx usually smooth, hemispherical, the limb deciduous, truncate, or more or less distinctly 4- toothed or calyptrate and circum-

sciss or irregularly rupturing. Petals 4. Stamens 8, equal; filaments short, subulate; anthers from ovate to oblong and dolabriform, opening by 2 longitudinal slits, the connective not produced, with or without spurs at the base of the back. Ovary adhering to the calyx, 4-celled, glabrous on the depressed apex; style filiform, with a club-shaped or thickened stigma. Berry more or less globular, truncate at the depressed apex, smooth or variously scaly or tubercled. Seeds angular-wedge-shaped.—Small trees or shrubs, with 3-nerved leaves. Flowers small, solitary, or clustered, or forming axillary cymes or panicles.

Flowers in small brachiate panicles . . . . . *P. coerulescens.*
Flowers in a sessile or almost sessile cyme or almost fascicled . *P. capitellata.*

1. **H. cœrulescens,** Jack.—An evergreen branched small tree, all parts quite glabrous; leaves from ovate to ovate-oblong, tapering into a short robust petiole, bluntish acuminate, entire, coriaceous, 2-3½ in. long, quite glabrous, glossy, especially beneath, 3-nerved, the transverse veins rather faint; flowers small, sky-blue, on ½ a line long or shorter strong pedicels, forming short, glabrous, brachiate, often almost sessile panicles in the axils of the leaves and also at the end of the branches; peduncles 4-cornered; bracts minute, ovate, acute; calyx about a line long and wide, truncate or obsoletely 4-toothed, in a dried state obscurely reticulate-scaly; petals ovate, acuminate; berries enclosed in the calyx, truncate-globular, about the size of a pepper-kernel, reticulate-rough, at the apex marked by the circular calyx-limb.

Hab.—Tenasserim.

2. **P. capitellata,** Jack.—An evergreen large shrub, all parts quite glabrous, the branches terete; leaves elliptically ovate to ovate, tapering in a strong 2-3 lin. long petiole, bluntish acuminate to bluntish, 3-5 in. long, coriaceous, entire, glabrous, rather opaque, strongly 3-nerved, with 2 faint intramarginal nerves, the transverse more or less curved veination faint; flowers small, sky-blue, on a line long pedicels, forming small, sessile or almost sessile, brachiate, glabrous cymes often reduced to mere clusters; calyx smooth, about 1¼ lin. long, smooth, truncate; berries depressed-globular, the size of a small pea, smooth, crowned by the shallow circular calyx-limb.

Hab.—Tenasserim.

MEMECYLON, L.

Calyx smooth, the tube hemispherical or bell-shaped, the limb dilated, entire, or shallowly 4-5-lobed, often radiately lamellate or nerved within. Petals 4 or 5. Stamens 8, equal; filaments fili-

form; anthers short, with a thick connective forming a conical or horn-like spur at the base, the cells opening in longitudinal slits. Ovary entirely adnate to the calyx, 1-celled, quite glabrous on the convex or depressed summit, with 6-12 ovules whorled round a central free placenta; style filiform, with a punctiform stigma. Berry globular, crowned by the calyx-limb or by a circular scar only, 1- or rarely 2-3-seeded. Seeds large, the cotyledons very much convolute or variously folded, usually enclosing the radicle.—Trees or shrubs, with usually penninerved or rarely 3-nerved leaves. Flowers usually small, in axillary clusters, cymes, or umbellets.

* *Calyx radiately nerved within, the nerves raised and lamellate, like the gills of a mushroom.*

○ *Leaves more or less thick coriaceous without visible lateral veins.*

† *Leaves with cordate or rounded base, sessile, or on very short thick petioles. Flowers conspicuous. Branchlets terete.*

Cymes and pedicels very short and robust; berries ovoid-oblong, rather large . . . . . *M. cæruleum.*

Cymes lax, peduncled, rather slender; pedicels slender, 2-3 lin. long . . . . . *M. pulchrum.*

†† *Leaves petioled, more or less tapering at base, when rounded contracted in a moperately long petiole.*

△ *Branchlets terete, without or only with very faintly raised lines. Flowers small, calyx up to a line in diameter, smooth, not tubercled.*

Leaves rounded at base, smooth and shining; petiole 3-4 lin. long; pedicels 2-3 lin. long; cymes simple or compound, peduncled . *M. edule.*

Leaves attenuate at base, sharply acuminate; pedicels, 1-1½ lin. long; umbel-like cymes short, peduncled . . . . *M. plebejum.*

Leaves attenuate at base, very acuminate, glossy; petiole 1-2 lin. long; pedicels hardly a line long, thick; cymes very short, almost sessile . . . . . *M. lævigatum.*

△△ *Branchlets more or less terete, marked with 4 blunt lines. Calyx about 1½ lin. wide.*

Pedicels thick and short; calyx undulate-truncate, with a hemispherical tubercled base; leaves bluntish or retuse, shortly acuminate . . . . . *M. punctatum.*

△△△ *Branchlets 4-angular or almost 4-winged.*

As former, but calyx-base smooth; cymes short peduncled or almost sessile; leaves turning dark coloured in drying . . *M. soutellatum.*

Cymes rather short peduncled; leaves 3-4 in. long, turning yellowish in drying . . . . . *M. elegans.*

Calyx about ½ lin. wide, sharply 4-toothed. Leaves only ½-1¼ lin. long; pedicels about a line long; cymes small, poor, almost sessile . . . . . *M. pauciflorum.*

○○ *Leaves thin coriaceous, with the lateral nerves and often also the veins more or less conspicuous, the nerves arcuate-anastomosing towards the margins.*

Umbellets in thyrsoid cymes; pedicels 1-2 lin. long; calyx ⅔ lin. wide, the limb sinuate-4-angular . . . . . *M. Griffithianum.*

As former, but pedicels more slender; cymes simple; calyx 1-1½ lin. wide; berries the size of a pea. . . . . *M. celastrinum.*

As former, but cymes short or almost reduced; berries the size of a cherry . . . . . *M. cerasiforme.*

* * *Calyx not radiate-lamellate veined within, or the nerves very faint.*

Leaves sessile or nearly so, turning yellowish and opaque in drying; cymes sessile, umbel-like; calyx conspicuously 4-toothed, *M. umbellatum.*

* *Calyx radiately nerved within, the nerves raised and lamellate like the gills of a mushroom.*

1. **M. cœruleum,** Jack.—An evergreen shrub, 10 or 12 ft. high, all parts glabrous, the branchlets terete or nearly so; leaves almost sessile or on a very short thick petiole, from elliptically ovate to ovate-oblong, rounded or almost cordate at the base, blunt or retuse and mucronate, or acute or rarely apiculate, 4-5 in. long, thick coriaceous, with the lateral nerves not or almost not visible, glabrous, the narrow hyaline borders recurved; flowers conspicuous, but not large, deep steel-blue, on short thick pedicels, forming a very short robust cyme on a very short peduncle, or almost sessile and solitary or several together in the axils of the leaves or above the scars of the fallen ones; peduncle and branchings thick and almost terete; bracts and bractlets minute, ovate-triangular, acute; calyx smooth, bell-shaped, about a line long and a little wider, the limb truncate and remotely minute-toothed, cruciately and lamellately 4-nerved within, the nerves 2-cleft from the middle, the 4 accessory nerves very faint; filaments very short, the connective very large, with a gland in front of the apex; berries ellipsoid-oval or ellipsoid-globular, smooth, about the size of a large pea, usually 1-seeded, crowned by the tubular at middle 4-angular scared calyx-limb, the disk marked by the 4 broad cruciately diverging nerves, 2-cleft from their middle.

Var. 1. **cœruleum proper:** berries ellipsoid-oval, up to nearly 5 lin. long; leaves almost sessile, usually acute.

Var. 2. **floribundum** (*M. floribundum,* Bl.): berries ellipsoid-oval, up to nearly 5 lin. long; leaves on a petiole 1-1½ lin. long, rounded at the base, usually acute.

Var. 3. **Griffithianum** (*M. cordatum,* Griff.): berries ellipsoid-globular, about 3-4 lin. in diameter; leaves almost sessile, often blunt or retuse with a mucro.

Hab.—Only var. 3, but this apparently frequent in Tenasserim.—Fl. July-Aug.; Fr. March.

2. **M. pulchrum,** Kz. — An evergreen tree, all parts quite glabrous, the branchlets nearly terete; leaves large, sessile, broadly ovate-oblong, rounded or almost cordate at the base, blunt or notched, 5-6 in. long, firmly coriaceous, 1-nerved without visible lateral nerves or veins, glabrous, glossy above; flowers sky-blue, on 1½ to 2½ lin. long, terete pedicels, in few-flowered umbellets supported

by ½-¼ in. long, 4-cornered secondary peduncles and forming a rather ample cyme on the compressed 4-cornered ½-1 in. long peduncles arising by 3 or 4 from above the scars of the fallen leaves; bracts distinct, ovate-lanceolate, acute; calyx bell-shaped, about a line long and wide, smooth, the limb truncate, radiately folded within.

Hab.—Tropical forests of the Andaman islands.—Fl. Begin, of May.—s.

3. **M. edule,** Roxb.; Bedd. Sylv. Madr. 113.—An evergreen little tree, often branched already from the base or remaining shrubby, all parts quite glabrous, the branchlets terete, the stem as thick as the arm or thicker; bark thin, blackish brown, longitudinally and thinly fissured; leaves ovate, at the rounded base contracted in a strong petiole 3-4 lin. long, bluntish and almost caudate-acuminate, 3-4 in. long, firmly coriaceous, smooth, shining above, the lateral nerves little visible; flowers sky-blue, small, on very slender 1-2 lin. long pedicels, in poor umbellets on the short ultimate peduncles, forming either a compact cyme by reduction of the lateral branchings apparently simple or more usually decompound peduncled thyrsoid cymes arising either solitary or by 2 or 3 from the axils of the leaves or from above the scars of the fallen ones; peduncles 4-6 lin. long, compressed, the secondary ones as long or somewhat shorter, the ultimate ones usually very short; calyx smooth, about a line across, the adnate portion somewhat obovate, radiately nerved within, the nerves hardly lamellate, raised; limb broad, obsoletely 4-toothed; petals about a line long, ovate, acute; filaments long-exserted; berries as large as a pea, glabrous, globular, when ripe bluish black and sappy, 1-seeded, crowned by the very short inconspicuous calyx-limb round a smooth disk.

Hab.—Tenasserim; not unfrequent in the tropical forests of South Andaman.—Fl. Apr.-May; Fr. June.—s.

4. **M. ovatum,** Sm.—An evergreen little tree or large shrub, all parts quite glabrous, the branchlets terete, with 4 elevated lines; bark dark coloured, rough; leaves from oval to oblong-lanceolate, tapering in a short petiole, bluntish to bluntish acuminate, sometimes almost notched, usually only 2-3 in. long, but often longer, entire, coriaceous, without any lateral nerves or veins, glossy above, quite glabrous; flowers small, blue, on rather short but slender terete pedicels, forming a small umbellet on the knob-like thickened apex of the ultimate ramifications and collected into short-peduncled compound umbels arising solitary or by 2-3 from above the scars of the fallen leaves or from the older branches; peduncles short, usually only 2-3 lin. long, 4-angular; calyx about ½ a lin. long, bell-shaped, lamellate-nerved within, the limb truncate and obsoletely denticulate; petals obovate, acute, about a line long; stamens long-exserted; berries globular, the size of a pea, when

ripe bluish black and edible, by abortion usually 1-seeded, crowned by the calyx-limb, the disk radiately 8-lamellate.

Hab.—Frequent in the tropical and moister upper mixed forests from Martaban down to Tenasserim; also Chittagong.—Fr. Nov.-Feb.—s.

5. **M. lævigatum,** Bl.—An evergreen small tree, all parts quite glabrous, the branchlets terete; leaves lanceolate to elliptically lanceolate, slightly oblique, at the acuminate base decurrent into a short robust petiole, longer or shorter acuminate, 3-4 in. long, thick coriaceous, without nerves or veins, glossy above, in drying turning more or less black; fruiting cymes very short peduncled or almost sessile, robust; pedicels thick and only a line long; berries globular, the size of a pea, 1-seeded, crowned by the short obsoletely 4-lobed calyx-limb, the disk radiately lamellate-nerved.

Hab.—Tenasserim.—Fr. Oct.

6. **M. plebejum,** Kz.—An evergreen tree (20—25+8—10+2—3), all parts quite glabrous, the branchlets terete with 4 raised lines; leaves ovate-lanceolate, tapering into a short petiole, sharply caudate-acuminate, 1½-2½ in. long, in drying turning blackish, thin coriaceous, the lateral nerves thin and faint; flowers minute, on 1-1½ lin. long slender pedicels, umbellate, and forming a very short peduncled or almost sessile trichotomously branched small cyme in the axils of the leaves; calyx explanate-bell-shaped, about a line in diameter; the limb ample, minutely and distantly 4-toothed, radiately lamellate within; petals, &c., unknown.

Hab.—Frequent in the swamp forests of the Irrawaddi alluvium; rather rare in the Prome and Ava.—s.—SS. = All.

7. **M. punctatum,** Prsl.—An evergreen shrub or tree (?), all parts quite glabrous, the branchlets with 4 decurrent raised lines; leaves from lanceolate to elliptically lanceolate, on a short but slender petiole 1-2 lin. long, shortly bluntish acuminate, but not retuse, thick coriaceous, without lateral nerves or veins, in a dried state blistered-dotted, 1-2 in. long, opaque; flowers small, on 1-1½ lin. long, thick, stiff pedicels, forming a poor umbellet on the 1-2 lin. long peduncle or almost sessile in the axils of the leaves or above the scars of the fallen ones; calyx about a line wide, the adnate portion almost globular and tubercled-rough; the limb ample and almost truncate, radiately lamellate within; petals ovate-triangular, acute; stamens exserted; berries globular, the size of a very small pea, almost smooth.

Hab.—Tenasserim.

8. **M. scutellatum,** Naud.—An evergreen bushy shrub or small tree, all parts quite glabrous, the branchlets 4-cornered and 4-lined; leaves small, from elliptically oblong and oblong to obovate, retuse

or bluntish, on a slender 1-2 lin. long petiole, 1-2 in. long, very coriaceous and without lateral nerves or veins, glossy above, beneath pale coloured; flowers small, sky-blue, on about a line long slender pedicels, forming 1 to 3 simple umbellets on an obscurely 4-gonous 1-1½ lin. long peduncle or almost sessile and clustered in the axils of the leaves or above the scars of the fallen ones; calyx broadly bell-shaped, with the adnate basal portion very obscure, smooth, about ½ lin. long or a little longer, broadly and shortly 4-toothed, the limb inside radiately 8-lamellate; petals ovate, acute, about a line long; stamens exserted; berries almost globular, the size of a small pea, smooth, 1-seeded, crowned by the short calyx-limb, the disk cruciately 4-nerved, the nerves 2-cleft from their middle.

Var. 1. **subsessile**: umbellets on peduncles less than a line long or almost sessile; pedicels about a line long; leaves smaller.

Var. 2. **brevipedunculatum**: umbellets on a 2-1 lin. long peduncle; pedicels usually 2 lin. long; leaves larger.

Hab.—Var. 2: apparently frequent in Tenasserim; also Pegu, above Rangoon.—Fl. Apr.-June; Fr. Feb.-May.

9. **M. elegans**, Kz.—An evergreen shrub or small tree, all parts quite glabrous, the branchlets almost 4-winged or with 4 decurrent more or less obsolete raised lines; leaves from oblong to ovate-oblong, at the base tapering into a 2-3 lin. long petiole, blunt or sometimes obscurely notched, 3-4 in. long, coriaceous, the lateral nerves only in young leaves visible; flowers blue, on 2-3 lin. long pedicels, forming a simple or trichotomous umbel-like cyme on ½-¾ in. long sharply 4-cornered peduncles arising usually by pairs or singly from the axils of the leaves or from above the scars of the fallen ones; ramifications very short or almost reduced; calyx smooth, nearly 1½ lin. in diameter, the adnate portion hemispherical, small; limb broad and explanate, waved and obscurely rounded-lobed, radiately-lamellate within, the lamellæ almost nerve-like; petals, &c., unknown.

Hab.—In the tropical forests of South Andaman.—Fl. May.—s.—SS.= SiS.

10. **M. pauciflorum**, Bl.—An evergreen tree (20—25+6—10 +½—1), all parts quite glabrous, the branchlets more or less sharply 4-cornered; leaves ovate to broadly ovate, on a slender petiole ¼-1 lin. long, bluntish apiculate or notched, rarely almost acute, 1-1½ in. long, coriaceous, smooth, glossy above, the lateral nerves very faint and thin; flowers minute, whitish, about ½ a line in diameter, on slender about a line long pedicels, either forming a very poor umbellet on ½ to a line long almost terete peduncles, or sessile or nearly so and clustered in the axils of the leaves; calyx

about ⅓ lin. long, bell-shaped, the adnate portion short, almost globular; limb almost abruptly 4-toothed (the teeth linear, acute), radiately narrow-lamellate inside; corolla in bud acuminate; berries globular, the size of a pepper-kernel, smooth, 1-seeded, crowned by the sharply toothed calyx-limb, the disk smooth or very faintly cruciately 4-nerved.

Hab.—Frequent in the tropical coast forests of the Andamans; also Tenasserim.—Fl. begin. of R.S.—s.

11. **M. Griffithianum,** Naud.—An evergreen large shrub, all parts quite glabrous, the branchlets ash-grey, almost terete, with 4 decurrent lines; leaves oblong to elliptically oblong, acute at the base and produced into a robust 1-2 lin. long petiole, shortly or rarely longer acuminate, thin coriaceous, about 3-5 in. long, glabrous, glossy above, the lateral nerves thin, but prominent and anastomosing towards the margins; flowers minute, on ½ to nearly a line long rather stiff pedicels, forming small poor umbellets on the summit of the thickened very short partial peduncles and collected in a rather ample thyrsoid compound cyme in the axils of the leaves or above the scars of the fallen ones; peduncle about ½-1 in. long, 4-cornered and sometimes compressed, the primary ramifications nearly as long and more sharply 4-cornered; calyx about ⅔ lin. in diameter, explanate, the limb truncate and radiately lamellate within, the borders obsoletely sinuate-4-angular; berries globular, the size of a pea, glabrous, one-seeded, crowned by the short calyx-limb, the disk radiately 8-lamellate.

Hab.—Tropical forests of Tenasserim.

12. **M. celastrinum,** Kz.—An evergreen tree (30—40 + 12—15 + 2—3½), all parts quite glabrous, the branchlets terete, with 4 raised decurrent lines; bark ash-grey, smooth, hardly a line thick; cut pale coloured, dry; leaves from elliptically to almost ovate-oblong and ovate-lanceolate, acute at the base, on a thick 2-2½ lin. long petiole, shortly or long and almost caudate-acuminate, with or without a mucro, 4-5 in. long, thin coriaceous, rather glossy above, turning more or less yellowish green in drying, the lateral nerves thin, but visible and anastomosing towards the margins; flowers small, sky-blue, on slender 1-2 lin. long pedicels, forming poor umbellets on the very short partial peduncles and collected into a single or more usually two greenish white, glabrous, peduncled cymes in the axils of the leaves; peduncle about 3 to 5 lin. long, more or less compressed; calyx white, smooth, nearly a line deep and 1-1½ lin. in diameter, bell-shaped, then explanate, almost truncate and minutely 4-toothed, radiately lamellate within; petals nearly a line long; berries globular, the size of large pea, glabrous, green, 1-seeded, crowned by the short calyx-limb, the disk radiately 8-lamellate.

Hab.—Frequent in the tropical forests from Martaban down to Tenasserim, less so in those along the eastern slopes of the Pegu Yomah.—Fl. Feb.-Apr.—Fr. January.—SS.=*Metam.* SiS.

Remarks.—Wood very coarse, red-brown.

13. **M. cerasiforme,** Kz.—An evergreen tree, all parts glabrous; leaves elliptical, acuminate at both ends, on a stout petiole 2-3 lin. long, 2½-3 in. long, coriaceous, usually drying yellowish, the laternal nerves faint and obsolete; fruiting cymes short peduncled or almost sessile, small and not above ½ in. long, glabrous, axillary or from above the scars of the fallen leaves; berries on a lin. long stout pedicels, globose, the size of a cherry, sappy, bluish black.

Hab.—Tropical forests of Chittagong.—Fr. C.S.

* * *Calyx inside without lamella-like nerves, or the nerves very obsolete.*

14. **M. umbellatum,** Burm.; Bedd. Sylv. Madr. t. 206.—An evergreen little tree or large shrub, all parts quite glabrous, the branchlets terete, with 4 raised decurrent lines; leaves almost sessile or rarely very shortly petioled, from elliptically oblong and oblong to elliptically lanceolate, more or less bluntish acuminate, 2-3 and sometimes 4 in. long, coriaceous, almost opaque, in drying turning yellowish, the lateral nerves indistinct; flowers small, sky-blue, on about 2 lin. long slender pedicels, forming a many-flowered umbel-like cyme on a very short (½ a line long) peduncle or almost sessile arising from above the scars of the fallen leaves; calyx nearly a line long and somewhat wider, with a hemispherical tube; limb broad, conspicuously 4-toothed, with the teeth broad and acute, very obscurely radiate-nerved within; petals about a line long, acute; berries ovoid-globular, about the size of a small pea, smooth, usually 1-seeded, crowned by the calyx-limb.

Hab.—Arracan and Andamans, in tropical forests.—s.—SS.=SiS.

Remarks.—Wood very strong and tough, very hard and close-grained. Good for cart-axles and forms a sort of box-wood. Leaves and flowers a yellow dye.

LYTHRARIEÆ.

Flowers hermaphrodite, very rarely unisexual, regular or rarely irregular. Calyx free, but often enclosing the ovary, 4-5- (very rarely 3- or 6- or more) -lobed or toothed, the lobes often alternating with as many accessory teeth. Petals as many as calyx-lobes, rarely wanting, inserted at the summit of the calyx-tube, usually clawed, imbricate and usually crumpled in the bud. Stamens as many as petals, or more or fewer, inserted in the calyx-tube; filaments inflected in the bud; anthers versatile, the cells opening longitudinally. Ovary superior or (in a few abnormal genera)

inferior, 2-6- or rarely by abortion of the partitions 1-celled, with usually numerous ovules attached to the axis or very rarely parietal; style simple, with a capitate or rarely 2-lobed stigma. Fruit a capsule, variously dehiscing, enclosed in or surrounded by the persistent calyx. Albumen none. Embryo straight; cotyledons oblong or orbicular-cordate.—Herbs, shrubs, or trees, with opposite, whorled, or sometimes alternate simple leaves. Stipules none. Flowers in axillary or terminal panicles, cymes, or clusters, rarely solitary.

The timber of *Lagerstræmia, Crypteronia,* and some others is valuable. Henna, a reddish orange dye, is the produce of *Lawsonia,* and a similar dye is obtained from the flowers of *Woodfordia.* Pomegranates are the only edible fruits in this family. Thirty-one species occur in Burma.

* *Ovary free, superior.*
× Leaves beneath blackish-dotted; calyx slightly curved; seeds pilose . . . . . *Woodfordia.*
× × Leaves without or with pellucid dots beneath. Calyx straight.
○ Stamens as many or twice as many as calyx-lobes.
Calyx 12-toothed; petals 6; stamens 12; capsule 1-celled, transversely circumsciss . . . . . *Pemphis.*
Calyx 4-parted; petals 4; stamens 8; capsule 4-celled, irregularly bursting . . . . . *Lawsonia.*
Calyx 4- or 5-cleft; petals none; stamens 4 or 5; capsule 2-celled and 2-valved . . . . . *Crypteronia.*
○ ○ Stamens indefinite, in 1 or 2 or more rows.
† Seeds free, not imbedded in pulp.
Stamens in 2 or more rows; capsule 3-6-celled; seeds large, expanded in a lateral wing . . . . . *Lagerstræmia.*
Stamens in a single row; capsule 4-8-celled; seeds minute, scobiform, narrowly winged at the upper margin . . . . *Duabanga.*
†† Seeds angular, imbedded in pulp; berry 10-15-celled . . . . . *Sonneratia.*
* * *Ovary adnate to the calyx, inferior, many-celled, the cells irregularly superposed;* stamens numerous in many rows; seeds pulpy . . . . . *Punica.*

WOODFORDIA, Salisb.

Calyx coloured, tubular, slightly curved with an oblique mouth, shortly 6-lobed, the lobes alternating with as many minute accessory teeth. Petals 6, small, or none. Stamens 12, inserted at the bottom of the calyx-tube, long-exserted, alternately longer, declinate. Ovary sessile, 2-celled, with numerous ovules attached to the very thick axile placenta; style filiform, with a punctiform stigma. Capsule enclosed in the calyx, compressed, 2-celled, loculicidally 2-valved. Seeds numerous, minute, somewhat compressed-obcuneate, papillose-pilose.—Shrubs or small trees, with opposite black-dotted leaves. Flowers crimson, usually cymose-panicled; pedicels 2-bracted at the base.

1. **W. fruticosa,** Kz. (*W. tomentosa,* Bedd. Sylv. Madr. 117, t. 14, f. 4; *W. floribunda,* Salisb.; Brand. For. Fl. 238).—A leaf-shedding large shrub, often growing out into a little tree of 12 to 15 ft. high, all parts more or less greyish pubescent or tolerably glabrous, the younger branchlets 4-cornered; leaves very shortly petioled or almost sessile, from linear-lanceolate to lanceolate, cordate or rounded at the base, acuminate, 3-5 in. long, entire, firmly membranous, above green and minutely pubescent, beneath black-dotted and greyish or whitish velvety or shortly tomentose; flowers nearly ½ an in. long, bright crimson, forming axillary short-peduncled cymes or small-leaved cymose panicles; calyx tubular, puberulous, tapering into a rather slender puberulous pedicel; petals only about a line long, crimson; capsules enclosed in the calyx, elongate-oblong, compressed, about 4-5 lin. long.

Hab.—Frequent in the mixed dry forests of the Prome District; rarely entering the drier upper mixed forests.—Fl. Fr. Jan.-Feb.—l.—SS.=CaS.

Remarks.—The flowers yield a valuable red dye of considerable importance.

PEMPHIS, Forst.

Calyx coriaceous, turbinate-bell-shaped, 6-lobed, the lobes erect, alternating with as many smaller, spreading, accessory teeth. Petals 6, inserted at the throat of the calyx. Stamens 12, almost 2-seriate, alternately shorter. Ovary enclosed in the calyx-tube, very shortly stalked, 3-celled, with many erect ovules attached to the thick axillary placentas of each cell; style rather thick and short, with a capitate stigma. Capsule enclosed in the calyx-tube, by obliteration of the septa 1-celled, irregularly circumsciss-dehiscent above the middle. Seeds many, compressed, obversely cunate, rather large, erect from a basilar placenta, expanded into a thick wing.—Shrubs, with opposite rather thick leaves. Flowers axillary, solitary, the peduncles 2-bracted at the base.

1. **P. acidula,** Forst.; Bedd. Sylv. Madr. 117, t. 14, f. 5.—An evergreen shrub, all parts more or less greyish silk-hairy, the younger parts 4-cornered; wood light brown, close-grained and strong; leaves almost sessile or very shortly petioled, from oblong to oblong-lanceolate, blunt or nearly so, about 1½ to ½ in. long, thick-membranous, entire, more or less silky-canescent on both sides, 1-nerved; flowers white, rather small, on short, thick, puberulous peduncles 2-bracted at the base, solitary in the axils of the leaves; calyx almost bell-shaped, elevated-12-striate, appressed tawny puberulous; petals white, repand; capsules oblong, about 3½ lin. long, very little protruded from the calyx, glabrous, crowned by the persistent style.

Hab.—Tenasserim, along the rocky coasts from Amherst down to Mergui; also Andamans.—Fl. Fr. Oct. and Apr.

LAWSONIA, L.

Calyx-tube broadly turbinate, 4-lobed, without accessory teeth. Petals 4, sessile. Stamens 8, inserted on an annular ring at the top of the calyx-tube, alternating by pairs with the petals. Ovary filling the calyx-tube, 4-celled, with many ovules in each cell; style filiform, with a small capitate stigma. Capsule surrounded at the base by the persistent calyx, irregularly bursting. Seeds numerous, angular-club-shaped.—Shrubs, with simple opposite leaves. Flowers in lax racemes, forming leafy panicles.

1. **L. inermis,** L. (*L. alba,* Lam.); Bedd. Sylv. Madr. 118, t. 14, f. 6); Brand. For. Fl. 238).—*Dan.*—A leaf-shedding much-branched shrub up to 10-12 ft. high, sometimes growing out into a little tree, all parts glabrous, the branches decussate and often spinescent at the apex; bark rusty-coloured; leaves from ovate and oblong to lanceolate, acute, or rarely obovate and blunt, very shortly petioled, entire, about an inch long or shorter, membranous, glabrous; flowers small, greenish yellow or white, on slender pedicels, in lax little racemes usually forming a large leafy terminal panicle; calyx smooth, deeply 4-lobed, the lobes spreading, about a line long; petals orbicular with incurved much-curled borders; capsule globular, 4-celled and grooved, the size of a very small pea, depressed at the top, crowned by the style.

Hab.—Often cultivated, especially in the Prome zone.—Fl. Fr. nearly ∞.

CRYPTERONIA, Bl.

Flowers polygamously dioecious or hermaphrodite. Calyx-tube cup-shaped, 4-5-lobed. Petals none. Stamens 4 or 5, inserted at the summit of the calyx-tube and alternating with the lobes. Ovary free, 2-celled, with numerous horizontal or ascending ovules attached in many series to the axillary placentas; style filiform, with an obtuse stigma. Capsule surrounded at the base by the calyx, 2-celled, loculicidally 2-valved. Seeds numerous, minute, wingless, or narrowly winged towards the apex.—Trees, with 4-corned branchlets and opposite entire leaves. Flowers minute, in axillary racemes often collected into panicles.

1. **C. paniculata,** Bl.—*Anan-hpo.*—An evergreen tree (50—80+30—50+4—9), all parts glabrous; bark silvery grey, rather smooth, deeply longitudinally, and minutely transversely, fissured, about ⅓ in. thick; cut brown; leaves oblong to oblong-lanceolate, acute at the base, bluntish acuminate or blunt, shortly petioled, entire, chartaceous, about 4-5 in. long, glabrous; flowers minute, whitish, on short but slender puberulous pedicels, forming slender,

puberulous or glabrous racemes arranged in terminal leafless panicles; ovary shortly greyish tomentose; calyx hardly 1-1½ lin. in diameter, 5-toothed, minutely appressed pubescent, the teeth triangular-lanceolate, acute; stamens in hermaphrodite flowers only as long as the calyx-teeth, in the males elongate and slender; capsules as large as a pepper-kernel, almost 2-lobed, minutely velvety and glabrescent, crowned by the persistent style; seeds minute, linear, brown and glossy, narrowly winged along one side, the wing produced at both ends.

Var. 1. **glabra** (*Henslovia glabra*, Wall.) : rachis of racemes, at least when in fruit, glabrous.

Var. 2. **pubescens** (*H. pubescens*, Griff., *not* Planch.) : rachis of racemes permanently densely puberulous.

Hab.—Var. 2. Frequent in the tropical and moister upper mixed forests, from Chittagong, Pegu, and Martaban down to Tenasserim.—Fl. Nov.-Jan.; Fr. Feb.-May.—s×l.—SS. = SiS. Metam., etc.

Remarks.—Wood pale to reddish brown, fibrous, close, but not straight-grained, rather heavy, the annual rings narrow. Used occasionally for cart-wheels, but more in use for firewood.

LAGERSTRŒMIA, L.

Calyx-tube turbinate-bell-shaped, 4-6- (rarely 7-) lobed, plain or plaited-furrowed. Petals 4-6, clawed, crumpled. Stamens numerous, inserted near the base of the calyx-tube; filaments long, exserted. Ovary sessile, enclosed in the calyx-tube, 3-6-celled, with numerous ascending ovules attached to the axillary placentas; style flexuose, filiform, with a capitate stigma. Capsule at the base surrounded by the calyx, woody or rigidly coriaceous, 3-6-celled, opening loculicidally into 3-6 valves, each valve bearing the partition in its centre. Seeds few or many, compressed, imbricate, terminating in a wing, the testa thick and spongy.—Trees or shrubs, with opposite entire leaves. Flowers usually showy, 2-bracteoled, in axillary or terminal usually trichotomously branched panicles.

* *Calyx terete, without ribs or furrows.*

○ *Calyx and all other parts glabrous.*

Leaves whitish-glaucous beneath; flowers hardly ½ an in. in diameter . . . . . *L. parviflora.*

Leaves uniformly green; flowers 1½-2 in. in diameter. . . *L. Indica.*

○ ○ *Calyx and inflorescence covered by a rusty-coloured tomentum.*

Flowers almost racemose, in panicles; calyx ½-⅔ shorter than the capsule . . . . . *L. calyculata.*

* * *Calyx furrowed, plicate-sulcate or angular, with the angles acute or almost winged.*

○ *Ribs or angles twice as many as calyx-lobes, the alternating shorter ones terminating at the sinuses of the lobes, the longer ones running throughout the lobes.*

× *Calyx and inflorescences covered by a rusty-coloured tawny or white floccose tomentum; calyx-lobes terminating in a subulate or short mucro.*

Full-grown leaves glabrous, acuminate; tomentum rusty-coloured; petals on short claws, not fringed . . . . . *L. floribunda.*

Adult leaves puberulous beneath, acuminate; tomentum whitish or yellowish; petals on long slender claws, ciliolate . . *L. tomentosa.*

As former; leaves mucronate or acute; flowers twice as large; petals conspicuously fringed . . . . . *L. Loudoni.*

× × *Calyx and inflorescence pruinose or minutely whitish or greyish puberulous. All other parts glabrous.*

Leaves whitish-glaucous beneath; calyx 10-12-angular, the angles acute . . . . . *L. hypoleuca.*

Leaves green; calyx plicately-sulcate, the ribs very blunt and broader than the furrows . . . . . *L. flos-reginæ.*

Leaves green; calyx longitudinally-furrowed without ribs . . *L. macrocarpa.*

○ ○ *Angles of calyx as many as lobes and alternating with them, the latter without ribs.*

All softer parts almost greyish from a short soft pubescence; angles of calyx almost winged; petals none . . . . *L. villosa.*

* *Calyx terete, without ribs or furrows.*

1. **L. parviflora,** Roxb.; Bedd. Sylv. Madr. t. 31; Brand. For. Fl. 239.—A leaf-shedding tree (20—30 + 10—15 + 3—5), often remaining shrubby, all parts glabrous; leaves oblong to ovate-oblong, rounded or almost cordate at the base, blunt or acute, 2-3 in. long, chartaceous, glabrous, whitish-glaucous beneath; flowers small, about ½ in. in diameter, white, on long filiform pedicels, by 2-3 or solitary on long slender peduncles and forming lax panicles in the axils of the leaves or at the end of the branchlets; calyx glabrous, without ribs or furrows, deeply 6- or occasionally 7-lobed, the lobes triangular, acute; petals orbicular, clawed, crumpled; outer 6 stamens much longer than the inner ones; capsules oblong or obovate-oblong, about an inch long, woody.

Hab.—Burma, probably Ava.—Griff.— Fl. Apr.

Remarks.—Wood greyish or light brown, close-grained, straight-fibrous, elastic, hard, takes very fine polish. □′=40 pd. Good for building purposes, beams, rafters, boats, axles, etc.

2. **L. Indica,** L.—A leaf-shedding tree (10—20 + 4—8 + ½—1½), all parts glabrous, the branchlets almost winged-cornered; leaves obovate to obovate-oblong, blunt or acute, very shortly petioled or almost sessile, chartaceous, 2-3 in. long, glabrous; flowers middling sized, crimson or white, slenderly pedicelled, solitary or in peduncled poor cymes forming a more or less branched glabrous panicle at the end of the branchlets; calyx glabrous, without ribs or furrows, deeply 6-lobed, the lobes oblong-lanceolate, acute; petals broad, crumpled and curled, on long claws; outer 6 stamens longer and larger than the numerous inner ones; capsules globose, more than ½ an in. in diameter, 6-celled and 6-valved.

Hab.—Generally cultivated in gardens of Ava, Pegu, and Martaban down to Tenasserim.—Fl. May-June.

3. **L. calyculata,** Kz.—*Pyimma-hpyoo.*—An evergreen tree (60—70+30—40+4—7), the shoots tomentose; bark quite smooth, about 2-3 lin. long, grey, peeling off into concave pieces; cut greenish pale-brown; leaves oblong, rounded at the unequal base and somewhat decurrent on the short petiole, acuminate, about 5-7 in. long, almost coriaceous, glabrous and minutely net-veined above, beneath puberulous and strongly net-veined between the prominent nerves; flowers not seen; panicles terminal, rusty or tawny tomentose, composed of longer or shorter racemes; fruiting calyx cupular-bell-shaped, about 2-2½ lin. deep, without ribs or furrows, densely rusty tomentose, 6-lobed, the lobes shortly triangular, acute, reflexed; capsules on very short thick pedicels either solitary or by 2 or 3 on a hardly a line long peduncle, oblong, mucronulate, glossy, for about ½ to ⅔ protruded from the closely embracing calyx, 3-4 lin. long, 6-valved.

Hab.—Frequent in the tropical forests of Martaban east of Tounghoo.—Fr. March-Apr.—s.—SS.=Metam.

Remarks.—Wood brown, heavy, of somewhat unequal fibre, close-grained, rather soft, soon attacked by xylophages.

* * *Calyx-furrowed, plicate-sulcate, or sharply, sometimes wingedly, angular.*

4. **L. floribunda,** Jack.—*Pyimma hpyoo.*—An evergreen small tree, the shoots tawny floccose-tomentose; bark white, smooth; leaves ovate-oblong to ovate-lanceolate, very shortly petioled, rounded at the base, acute, chartaceous, 4-6 in. long, while young tawny floccose beneath, but soon turning quite glabrous, uniformly green; flowers middling sized, about 1½ in. in diameter, rose-coloured and turning white, on shorter or longer jointed tawny floccose-tomentose pedicels, solitary or in peduncled poor cymes, forming a lax, branched, tawny or rusty floccose-tomentose panicle at the end of the branchlets; calyx in bud turbinate, densely tawny floccose-tomentose, strongly 12-sulcate-ribbed, the alternating ribs excurrent in the 6 (or occasionally 7) lanceolate and acute lobes and forming a straight tomentose mucro; petals about ½ an in. long, orbicular, waved; outer stamens curved, much longer than the inner ones.

Hab.—Tropical forests of Upper Tenasserim.—Fl. July-Aug.—s.

5. **L. tomentosa,** Prsl.—*Lai-za.*—A leaf-shedding tree (70—100 +50—60+7—12), the shoots whitish or somewhat tawny tomentose, the trunk strongly buttressed at the base; bark about ⅓ in. thick, greyish, fibrous, but even, dark grey, longitudinally fissured;

leaves from ovate-lanceolate to ovate-oblong, rounded at the base, on a 2-3 lin. long, densely whitish tomentose, glabrescent petiole, acuminate, 4-6 in. long, firmly membranous, while young, especially beneath, densely whitish or somewhat tawny tomentose, turning glabrescent above, beneath puberulous and elegantly net-veined; flowers middling sized, about 1-1¼ in. in diameter, white, changing into pale lilac, on jointed white or yellowish-floccose pedicels, usually in rich dichotomously branched peduncled cymes forming densely white or yellowish white floccose-tomentose short panicles at the end of the branchlets; calyx in bud turbinate, densely whitish or light tawny floccose-tomentose, strongly sulcate, 10-12 ribbed, 5-6-lobed, the lobes reflexed, lanceolate, acute, hardly mucronate; petals oblong and blunt or sometimes ovate and acuminate in the same flower, on a long filiform claw, waved and minutely ciliate; style very long; capsules oblong, mucronulate, under ½ an in. long, smooth and glabrous.

Hab.—Frequent all over Pegu and Martaban, in the tropical and moister upper mixed forests.—Fl. Apr.-May; Fr. May-June.—s: l.—SS.=Metam.—SiS.

Remarks.—Wood dark brown, close-grained, heavy, the annual rings distinct and narrow. □′=53 pd. Valued for bows and spear-handles; also used for canoes and cart-wheels. Exudes red resin.

6. **L. Loudoni,** T. & B.—A small tree, the younger softer parts tomentose; leaves oblong to elliptically and oval-oblong, on a tomentose petiole 1-2 lin. long, rounded or obtuse at the base, blunt or acute, coriaceous, soon glabrous above, beneath almost scurfy greyish tomentose; flowers showy, first white, then blue, shortly pedicelled, forming scurfy tomentose terminal thyrsoid panicles; calyx densely tawny and scurfy tomentose, 8-ribbed and 8-lobed, the alternating ribs excurrent into the lanceolate acute lobes of 2 lin. length; petals 8, broadly obovate, cuneate at the base, nearly an in. long, erose and longish fringed; ovary silky-tomentose; capsule white-tomentose, globose.

Hab.—Adjoining provinces of Siam.—Fl. H.S.

7. **L. hypoleuca,** Kz.—A tree (60—70+25—30+5—9), shedding leaves in H.S., all parts glabrous; bark thin, whitish; leaves lanceolate to oblong-lanceolate, decurrent at the acuminate base, shortly petioled, acuminate, entire or waved, chartaceous, 6-8 in. long, whitish glaucous beneath; flowers middling sized, about 1-1½ in. in diameter, lilac, on jointed whitish puberous pedicels, solitary, or in poor, short-peduncled, minutely greyish puberulous cymes forming elongate panicles at the end of the branches; calyx in bud turbinate, whitish from a minute velvety pubescence, sulcate-10-ribbed, the alternate ribs excurrent into the 5 triangular acute lobes and forming a straight minute mucro; petals oblong, waved, about ½ an in. long; capsule oblong, mucronate, woody, about ⅔ in. long.

Hab.—Common in the moister upper mixed forests of the Andamans.—Fl. June-July; Fr. C.S.—SS.=*SiS.*—Chloritic rocks, etc.

Remarks.—Wood greyish brown, narrow-streaked, close-grained and heavy.

8. **L. flos-reginæ,** Retz; (*L. reginæ,* Roxb.; Bedd. Sylv. Madr. t. 29; Brand. For. Fl. 240).—*Pyimma.*—A tree (50—60+20—30+6—12), leafless during H.S., all parts glabrous; bark grey; leaves oblong to oblong-lanceolate, acute or rarely obtuse at the base, bluntish acuminate, almost blunt or bluntish apiculate, shortly petioled, 5-9 in. long, chartaceous, entire, glabrous, more or less parallel-penninerved; flowers conspicuous, purplish lilac or rarely white, 2-3 in. in diameter, on rather thick greyish powdery pedicels, in small peduncled cymes, or the upper ones singly, forming terminal panicles; calyx turbinate in bud, whitish greyish or tawny powdery or velvety, strongly and deeply furrowed-ribbed, all or only the intermediate ribs abruptly broken at the base of the 6 lobes, the latter oblong-lanceolate, acute, thick coriaceous, thickened on the borders; petals about an inch long, almost orbicular, shortly clawed, crumpled and curled; stamens all equally long; capsules from oblong to nearly globose, ½ to ¾ in. long, mucronate, 6-celled; seeds brown and smooth, corky, irregularly 3-angular, laterally expanded into an oblong wing.

Hab.—Common in the mixed forests, all over Burma from Chittagong and Ava down to Tenasserim, up to 2,000 ft. elevation.—Fl. H.S.; Fr. C.S.—l.—SS.=∞*SiS.*

Remarks.—Wood pale or dark brown, rather heavy, streaked, fibrous, but close-grained, takes a fine polish. $\square^{i}$= 37 pd.—Used for house-posts, planking, beams, scantling for roofs, carts, boats, paddles, oars, etc. Exudes a resin.

9. **L. macrocarpa,** Wall.—*Kone-pyimma.*—A tree (30—40+8—15+5—3), leafless in H.S., all parts glabrous; leaves oblong to ovate-oblong, shortly petioled, usually large, especialiy those of the young shoots (attaining sometimes 1½ ft. in length), the older ones varying from 5-6 to 9 in. in length, blunt, bluntish apiculate or rarely acuminate, chartaceous, entire, glabrous; flowers from 3 to 3½ in. in diameter, lilac or purplish lilac, on rather thick greyish powdery pedicels, singly or by 2 or 3 in peduncled cymes, forming poor and rather short panicles at the end of the branchlets; calyx in bud oblong-turbinate, greyish velvety, finely sulcate, but not ribbed, the 6 lanceolate acute lobes not thickened along the borders; petals 1-1½ in. long, broadly elliptical or almost orbicular, clawed, crumpled and waved; stamens all equally long; capsules 1-1½ in. long, woody, oblong, mucronate; seeds as in the preceding species, but larger.

Hab.—Common in the mixed and open forests, from Ava and Martaban as far down as Moulmein.—Fl. H.S.; Fr. C.S.—l.—SS=∞.

10. **L. villosa,** Wall.—*Young-ka-lay.*—A tree (40—50+15—20

+3—5), shedding leaves in H.S., all softer parts shortly and softly pubescent; leaves ovate to ovate-oblong, on a very short pubescent petiole, rounded at the base, more or less acuminate, firmly membranous, 2-4 in. long, minutely velvety above, shortly and almost greyish pubescent or puberulous beneath; flowers small, whitish, on slender pubescent pedicels in peduncled cymes, forming softly, but shortly pubescent contracted panicles at the end of the branchlets; calyx in bud turbinate, densely and shortly greyish puberulous, 4-5- or 6-ribbed, the ribs almost wing-like, lobes as many as ribs, triangular, acute, as long as the tube; petals minute, not longer than the calyx-lobes, cuneate-lanceolate, acute; anthers purple; capsule oblong, about ½ an in. long, mucronulate, 4-6-valved.

Hab.—Frequent in the tropical forests along the slopes of the Pegu Yomah, rather rare in those of Martaban.—Fl. June.—s.—SS.=SiS. Metam.

Remarks.—Wood pale brown, rather heavy, somewhat close-grained, rather coarsely fibrous. Not much used. □′= 40 pd.

DUABANGA, Ham.

Calyx-tube broadly turbinate, adnate to the base of the ovary, 4-7-lobed, the lobes very thick, spreading. Petals 4-7, shortly clawed. Stamens numerous, inserted in a single row round a perigynous ring; filaments incurved, thick-filiform. Ovary 4-8-celled, with a hollow axis and very numerous ascending ovules in each cell irregularly attached to the very thick placentas; style elongate, flexuose, with a capitately 4-8-lobed stigma. Capsule supported by the thick spreading calyx, thick coriaceous, perfectly or imperfectly 4-8-celled, opening loculicidally into 4-8 valves. Seeds many, scobiform, at both ends produced, narrowly winged on the upper margin.—Trees, with distichous, opposite, entire leaves. Flowers usually large, in pendulous terminal panicles.

1. **D. sonneratioides,** Buch.—*Myouk-gne.*—A tree (80—100+50—80+10—12), shedding leaves in H.S., all parts glabrous, the branchlets 4-cornered and drooping; bark dark grey, transversely wrinkled and fissured; cut dryish, pale coloured; leaves oblong to ovate-oblong, rounded or almost cordate at the base, on a short thick petiole, shortly acuminate, firmly chartaceous, 7-12 in. long, entire, glabrous, glaucous beneath; flowers about 2-2½ in. in diameter, white, on thick jointed pedicels tapering downwards, singly or by threes, on short peduncles and forming a short, drooping, glabrous panicle at the end of the branchlets; petals cuneate-obovate, crispate along the borders, about an inch long; capsule the size of a small wood-apple, ovoid-globose, glabrous.

Hab.—Frequent in the tropical and mixed forests all over Burma from Chittagong and Ava down to Tenasserim, rather rare in the dry districts of Prome.—Fl. March-Apr.; Fr. May.—l & s: l.—SS.=Metam. SiS., etc.

REMARKS.—Wood yellowish, turning pale brown or greyish, somewhat mottled, heavy, coarsely fibrous, but rather close-grained, rather hard, takes good polish. □′=30 pd. Used in house-building.

SONNERATIA, L.f.

Calyx thick coriaceous, the tube broadly bell-shaped, at the base adnate to the ovary, 4-6-lobed, the lobes lanceolate or triangular. Petals 4-8, narrow, or none. Stamens numerous, inserted at the summit of the calyx-tube, inflected in bud. Ovary 10-15-celled, with very numerous ascending ovules covering the thick axile placentas; style elongate, with a funnel- or umbrella-shaped stigma. Fruit fleshy and indehiscent, supported by the persistent calyx and adnate to it at the base. Seeds immersed in pulp, angular.—Trees or shrubs, with opposite entire leaves. Flowers often large, solitary or by 3 to 5 in the axils of the upper leaves or at the end of the branchlets.

* *Stigma infundibuliform-capitate, small. Calyx* 6-8-*lobed.*
○ *Petals present.*
Leaves obovate, broad; petals linear-lanceolate, dark-purple; calyx terete . . . . . *S. acida.*
○ ○ *No petals.*
Calyx in bud elliptically oblong, acute, the tube in bud obsoletely, afterwards strongly 6-8-angled . . . . . *S. alba.*
Calyx in bud ovoid, obtuse, the tube remaining terete . . . *S. Griffithii.*
* * *Stigma large, nearly* 3 *lin. in diameter, conically umbrella-like. Calyx* 4-*lobed, terete.*
Leaves oblong to lanceolate; no petals . . . . . *S. apetala.*

1. **S. acida,** L.f.; Bedd. Sylv. Madr. 118; Brand. For. Fl. 242.—*Tupoo* or *tamoo.*—An evergreen small tree, 10 to 15 ft. high, all parts glabrous, the branchlets jointed, 4-cornered; leaves obovate to obovate-oblong, tapering into a broad but short petiole, blunt or usually retuse, entire, coriaceous, 2-4 in. long, glabrous, the nerves little or not visible; flowers about 2 in. in diameter, on very short thick peduncles, solitary at the end of the branchlets; calyx-tube terete, shallow, about ¾ in. across, with usually 6, rarely 7 or 8, thick, reflexed, acute lobes; petals linear, acuminate, 1½ in. long, dark purple; filaments 1-1½ in. long; ripe berries 2-2½ in. in diameter, depressed-globular, many-celled.

HAB.—Frequent in the littoral (especially the mangrove) forests all along the coasts from Chittagong down to Tenasserim and the Andamans, ascending the rivers as far up as the tidal waves.—Fl. R.S.; Fr. C.S.—l (?) —SS.=Sal.

REMARKS.—Wood soft, light and perishable.

2. **S. alba,** Sm.—An evergreen small tree, 10 to 15 ft. high, remaining often shrubby, all parts glabrous, the branchlets rather terete; leaves obovate or broadly obovate, at the base decurrent on the rather short petiole, blunt or retuse, 2-4 in. long, coriaceous,

glabrous, the nerves little visible; flowers rather large, about 1½ to 2 in. in diameter, sessile on the short jointed pedicel (the base of the calyx finally elongating into a spurious pedicel), usually by 2 or 3, each seated on a terete jointed peduncle at the end of the branchlets; calyx in bud elliptically oblong, acute, obsoletely cornered at the base, afterwards sharply 6- or rarely 7-8-angular; lobes as many as angles, oblong-lanceolate, acute; petals none; stamens about 1½ in. long; stigma funnel-shaped; berries supported by the sharply angular turbinate calyx, depressed-globose.

Hab.—In the littoral forests along the coast of the Andamans.—Fl. Apr.-May.—l.—SS.=Sal.

3. **S. Griffithii,** Kz.—*Tapyoo.*—An evergreen tree, 30 to 40 ft. high, all parts quite glabrous, the branchlets terete or 4-cornered; leaves obovate to obovate- or deltoid-oblong, blunt or retuse, at the base decurrent on the rather short petiole, coriaceous, 3-5 in. long, glaucous-green; flowers pure white, about 1½ in. in diameter, sessile on the short jointed pedicel, solitary, on a jointed terete peduncle at the end of the branchlets; calyx in bud ovoid, blunt, also in fruit quite terete, 6- rarely 7-8-lobed, the lobes oblong, acute; stamens and stigma as in preceding species; berries (according to Griffith) globose, the size of a poppy capsule, on both sides complanate, crowned by the remains of the style and supported by the terete reflexed-lobed calyx.

Hab.—Common in the littoral forests from Pegu down to Tenasserim, ascending the rivers as far as they are brackish.—Fl. Apr.-May.—s.—SS.=Sal.

4. **S. apetala,** Buch.; Bedd. Sylv. Madr. 118, t. 15, f. 1.—*Kanpala.*—An evergreen tree (40—50+15—25+3—4), all parts glabrous, the branches pendulous, and the foliage of a light glaucous-green; leaves from oblong-lanceolate to lanceolate and linear-lanceolate, tapering into a rather long petiole, narrowed at the apex and blunt, 3-4 in. long, coriaceous, glaucous-green, the nerves indistinct; flowers rather small, whitish, apetalous, about an inch in diameter, on terete or 4-cornered about an inch long peduncles, usually by 3-5 at the end of the branchlets; calyx in bud oblong, bluntish, terete, 4-lobed, the lobes oblong, acute; stamens as long as the calyx-lobes; stigma very large, conically peltate; berries globular, as large as a bullet, 4-6-celled, supported by the terete erect-lobed calyx.

Hab.—Very common in the littoral (chiefly the tidal) forests of the coasts of Pegu down to Tenasserim, ascending the rivers as far as they are brackish.—Fl. June-July; Fr. R.S.—l.—SS.=Sal.

Remarks.—Wood red, coarse-grained, strong and hard. Good for house-building, packing-boxes, etc.

PUNICA, L.

Calyx persistent, 5-7-lobed, the tube at the base adnate to the ovary, turbinate, widened beyond the ovary. Petals as many as calyx-lobes, inserted at the summit of the calyx-tube. Stamens numerous, in many rows at the summit of the calyx-tube; filaments filiform, inflected. Ovary inferior, many-celled, the cells superposed in 2 rows with numerous ovules in each attached in many rows to the strong parietal placentas or partitions; style filiform, flexuose, with a capitate stigma. Berry inferior, crowned by the calyx-limb, with a thick coriaceous rind, many-celled, the cells irregularly superposed, with the septa membranous. Seed numerous, angular, with a sappy red testa.—Small trees, with opposite or almost opposite clustered leaves, the branches sometimes spiny. Flowers large, solitary or almost clustered, axillary.

1. **P. granatum,** L.; Bedd. Sylv. Madr. 119; Brand. For. Fl. 241.—*Tha-lè.*—A small tree, often remaining shrubby, with terete sometimes spinescent branches, all parts glabrous; leaves usually crowded on the lateral short branchlets, oblong to oblong-lanceolate and linear, on a slender or short petiole, blunt or acute, $1\frac{1}{2}$-2 in. long, membranous, glabrous; flowers large, crimson (rarely white), on very short pedicels, axillary, solitary, or by 2 or 3; berries the size of an apple, spherical or nearly so, crowned by the tubular calyx-tube, yellowish green, smooth, containing numerous rose-coloured watery-pulpy oblong seeds in the numerous superposed cells.

Hab.—Not unfrequently cultivated in the drier parts of Ava and Prome.—Fl. Jan.-Feb.

SAMYDACEÆ.

Flowers regular, usually hermaphrodite. Calyx coriaceous, persistent, 3-7-lobed, the lobes imbricate or valvate, Petals 3-7, rarely more, usually resembling the calyx-lobes in consistence, perigynous and imbricate in bud, or none. Disk cupular, annular or glandular. Stamens perigynous, indefinite or rarely definite, usually opposite the petals, and alternating with small glands or scales. Ovary superior or more or less inferior, 1-celled, with 2-3 or more several-ovuled parietal placentas; style simple, or 2-3 or more -cleft. Fruit indehiscent or capsular and opening into valves. Seeds often arillate, with a fleshy albumen. Embryo straight or nearly so, the radicle next the hilum; cotyledons flat.—Trees or shrubs, with usually alternating simple leaves. Stipules small or none. Flowers inconspicuous, in racemes, panicles, or clusters.

A small order of no particular uses. The timber of some species of *Homalium* is very close-grained and hard.

Petals none; stamens 6-15; ovary superior . . . . *Casearia.*
Petals 4-12; stamens as many or more; ovary inferior . . *Homalium.*

CASEARIA, L.

Calyx-tube short or slightly elongated, the limb 4-5-lobed. Petals none. Stamens 6-15, or rarely more, alternating with as many short scales or staminodes, in a single row and united at the base into a perigynous ring. Ovary superior, 1-celled, with 3 or rarely 4 parietal placentas; style simple or shortly 3-lobed. Fruit somewhat succulent and opening into valves, or more fleshy and indehiscent. Seeds often with a bright-red arillus.—Trees or shrubs, with simple leaves often (not always) transparently dotted. Stipules lateral. Flowers usually small, in axillary clusters, rarely in corymbs.

* *Filaments very slender, many times longer than the anthers.*
× *Stamens and staminodes* 8 *each, separately inserted.*
All parts glabrous; leaves coarsely crenate; flowers about 2 lin. in diameter; pedicels and calyx glabrous . . . . . *C. canziala.*
Young shoots, calyx, pedicels, and often also the nerves of under side of the serrulate leaves, puberulous; flowers only a line in diameter . . . . . *C. glomerata.*
×× *Stamens and staminodes* 8 *each, united at the base and forming a broad disk round the ovary.*
All parts, also the flowers and pedicels, more or less tomentose or puberulous . . . . . *C. tomentosa.*
** *Filaments short, only as long as the anthers.*
All parts, also the flowers and pedicels, more or less tomentose or puberulous . . . . . *C. vareca.*

1. **C. canziala,** Wall.—A tree (40—50+15—25+3—4), leafless in H.S., all parts quite glabrous; bark ½ an in. thick, dry, brown, corky-fibrous like teak; leaves oblong, 7-8 in. long, shortly and bluntish acuminate, somewhat unequal and rounded at the base, on a glabrous petiole ½ an in. long, bristly-crenate-toothed, chartaceous, glabrous, conspicuously net-veined; flowers small, more than 2 lines in diameter, greenish, on 2-3 lin. long glabrous pedicels, clustered on a scaly shaggy tubercle arising from above the scars of the fallen leaves; sepals oblong, blunt, about a line long; stamens 8, not united at the base, alternating with as many very villous staminodes; filaments slender, many times longer than the anther; ovary hirsute at the apex; capsules about ½ an in. long or somewhat longer, oblong, 1-celled, 2-valved, containing 3 to 6 seeds enveloped in a red arillus.

Hab.—Frequent all over Pegu and Martaban, especially in the lower mixed forests.—Fl. Apr.-May; Fr. May-June.—s+l.—SS.=All.

Remarks.—Wood hard, pale brown.

2 **C. glomerata,** Roxb.—A shrub, the young shoots minutely puberulous; leaves ovate to ovate-lanceolate, on a puberulous 2-3 lin. long petiole, somewhat unequal at the base, acuminate, serrulate, chartaceous, 2½-4 in. long, not pellucid-dotted, beneath on the midrib or on the nerves slightly puberulous, often quite glabrescent; stipules small, pubescent, deciduous; flowers minute, greenish, only about a line in diameter, on 1-2 lin. long, elongating, puberulous pedicels, clustered on scaly chaffy tubercles arising in the axils of the leaves; sepals 5, about half a line long, oblong, rather blunt, densely puberulous outside; stamens 8, not united at the base, alternating with as many clavate fringed staminodes; filaments slender, many times longer than the anther; ovary glabrous; style pubescent, rather short; stigma large; capsules on 4-5 lin. long stiff peduncles, elliptically oblong, 2-valved, berry-like, about 6 lin. long.

Var. 1. **glabriuscula**: leaves almost glabrous.

Var. 2. **puberula**: petioles and leaves beneath on the nerves puberulous.

Hab.—var. 2: in Chittagong; var. 1: Ava, Kakhyen hills.

3. **C. Vareca,** Roxb.—An evergreen shrub, the shoots pubescent; leaves oblong, acute at the base, on a puberulous petiole about 2 lin. long or shorter, apiculate, serrulate, almost membranous, 3-4 in. long, glabrous above, puberulous or pubescent beneath; flowers minute, greenish white, on short glabrous pedicels, arising from densely scaly tawny-pubescent axillary buds, and clustered; calyx glabrous, the lobes orbicular, nearly a line long; stamens 8, included, the filaments rather shorter than the anthers, alternating with as many oblong short staminodes; ovary and the short style glabrous; capsules small, about 3 lin. long or somewhat longer, sessile, trigonously ovoid, glabrous, 1-celled, few-seeded, the seeds enveloped in a scarlet aril.

Hab.—Ava hills.

HOMALIUM, Jacq.

Calyx-tube turbinate or oblong, at the base adhering to the ovary, the limb 4-12 lobed. Petals as many as calyx-lobes. Stamens 1 or more, opposite the petals, alternating with glands. Ovary 1-celled, half-inferior, with 3-5 parietal 2-6-ovuled placentas in the upper free part of the ovary; styles as many as placentas. Fruiting calyx slightly enlarged, surrounded by the persistent calyx-lobes and petals, usually opening at the top between the placentas in short valves.—Trees or shrubs, with simple, not

dotted leaves. Flowers in axillary spikes or racemes or in terminal panicles.

* *Stamens solitary and opposite the petals.*
○ Flowers about 2 lin. in diameter.
Ovary villous; leaves coriaceous, tomentose or puberulous beneath; flowers tomentose, sessile; racemes robust, tomentose . . *H. tomentosum.*
Ovary villous; leaves thin chartaceous, pubescent on the nerves; flowers tomentose, shortly pedicelled; racemes pubescent, slender . . . . . *H. Griffithianum.*
○ ○ Flowers about a line in diameter.
All parts, also the inflorescence, quite glabrous . . . . *H. minutiflorum.*
** *Stamens by 2 or more, opposite the petals. All parts quite glabrous.*
Ovary glabrous; racemes slender, glabrous; stamens by twos . *H. fœtidum.*
Ovary tomentose; flowers longish pedicelled, in divaricate terminal panicles; stamens by threes . . . . . *H. Schlichii.*

1. **H. tomentosum,** Bth.—*Myouk-chaw.*—A tree (80—90+40—50+8—10), leafless in H.S., the branches horizontal, all softer parts more or less pubescent or tomentose; bark very thin, quite smooth, green-herbaceous below the white secedent epidermis; leaves broadly obovate to obovate-oblong, on a very short thick petiole, blunt or apiculate, more or less repand-crenate, coriaceous, 3-5 in. long, glabrous above, beneath more or less puberulous or tomentose, strongly parallel-nerved; flowers minute, greenish, almost sessile, in small clusters, forming robust, tawny or whitish tomentose racemes in the axils of the leaves and usually much longer than them; calyx-tube short, conical, tomentose; lobes 5 or 6, linear-oblong; petals as many and almost conform with the calyx-lobes; stamens 5, alternating with as many orange-coloured, spherical, almost sessile staminodes; filaments broader towards the base, about as long as the petals; anthers dark purple; ovary villous.

Hab.—Common in the mixed forests from Chittagong, Pegu, and Martaban down to Arracan, rare in Prome.—Fl. Fr. Nov.-Jan.—l.—SS.=∞*SiS.*

Remarks.—Wood light yellow, turning pale to greyish brown, very heavy, very close-grained, but of unequal fibre, rather soft, takes very fine polish. □′ =56 pd.—Used for teeth of harrows. Good for furniture.

2. **H. Griffithianum,** Kz.—A small tree, all younger parts softly tawny-pubescent; leaves oboval to obovate-oblong, on short, but slender densely-pubescent petioles, apiculate or shortly acuminate, especially towards the point more or less coarsely repand-toothed, thin chartaceous, while young pubescent all over, when adult, especially on the nerves, pubescent or pilose; flowers yellowish white, small, about 3 lin. in diameter, on short tomentose pedicels, solitary or more generally by 2 or 3, forming simple, slender, densely tawny-pubescent racemes or racemose panicles in the

axils of the leaves and usually as long or longer than them; calyx-tube short, conical, tomentose; lobes 6, linear, acuminate, pubescent, about ½ lin. long; petals 6, obovate-cuneate, twice the length of the calyx-lobes, very villous along the borders; stamens as long as the petals, filiform; ovary villous.

HAB.—Tenasserim.

3. **H. minutiflorum,** Kz.—A glabrous evergreen tree; leaves oblong, on a strong petiole 3-4 lin. long, bluntish apiculate, 3-5 in. long, coarsely crenate, thin coriaceous, glabrous; flowers minute, about half a line in diameter, on short, filiform, glabrous pedicels, clustered, forming simple or slightly branched glabrous racemes either solitary or by pairs from the axils of the leaves; calyx glabrous, the segments oblong-linear, villous-ciliate; filaments very slender, placed singly opposite the petals.

4. **H. fœtidum,** Bth.—A small evergreen tree, all parts quite glabrous; leaves from broadly oblong to elliptically oval, on a thick, smooth petiole 3-4 lin. long, apiculate, coarsely crenate-toothed, chartaceous, 4-6 in. long or longer, glabrous; flowers 6-10-merous, greenish, about 2 lin. in diameter, on very short puberulous pedicels, clustered, forming simple or branched, slender, minutely puberulous racemes in the axils of the leaves; calyx-tube shortly turbinate, greyish puberulous, the segments obovate-cuneate, ciliate; petals oblong-linear, densely fringed with white hairs, somewhat longer than the sepals; stamens by pairs opposite the petals, alternating with as many short obovate scales much longer than the petals; ovary glabrous, 4-lobed, with 4 styles.

HAB.—Tenasserim.

5. **H. Schlichii,** Kz.—An evergreen tree, all parts glabrous, leaves elliptical to ovate, acute at the base, on a strong petiole 3-4 lin. long, bluntish acuminate, 3-4 in. long, coriaceous, coarsely crenate, glabrous, glossy above; flowers small, on greyish pubescent 1-2 lin. long pedicels, forming grey-pubescent terminal divaricate panicles; calyx grey-pubescent, the segments linear-oblong, bluntish; petals almost conform but broader; stamens by threes opposite the petals; ovary tomentose.

HAB.—Tropical forests of Chittagong.—Fl. H.S.

PASSIFLOREÆ.

Flowers hermaphrodite or unisexual, regular (in *Papayaceæ* the males and females dissimilar). Calyx-tube short or rarely elongate; lobes 3 or more, valvate, or more or less imbricate. Petals as many as calyx-lobes, inserted at their base and alternating and more or

less conform with them, free or united in a bell-shaped corolla, sometimes small or rarely wanting; corona simple or double, on the bottom or on the throat of the calyx, or cut into radiating or erect threads, seldom none. Disk urceolar or annular, or dissolved into glands or staminodes, rarely none. Stamens usually as many, rarely twice as many, as calyx-lobes, inserted at the base of the calyx, but often connate with the ovary-stalk to near the top; filaments free or monadelphous; anthers basifix or versatile, the cells opening inwards. Ovary superior, usually stalked, 1-celled, with 3 or rarely 5 parietal several-ovuled placentas; style 3-5-branched. Fruit indehiscent and succulent, or opening in valves between the placentas. Seeds scrobiculate or cancellate, usually arillate. Albumen copious or scanty, fleshy. Embryo straight, with leafy cotyledons, the radicle next the hilum.—Climbers or rarely erect shrubs or trees, with alternate, simple, or divided leaves and stipules. Flowers solitary or in cymes or racemes, axillary. Tendrils axillary, often accompanying or terminating the peduncles, or none.

An order of no special interest to the forester. Papaw, the fruit of *Carica papaya*, is eaten, and so are the fruits of several *Passifloras*. Only 5 species are found in Burma, nearly all climbers or twiners.

CARICA, L.

Flowers unisexual and sometimes hermaphrodite, the males and females dissimilar. Calyx very small, 5-lobed. Corolla of the males salver-shaped, with a slender elongate tube, in the females without tube and the lobes erect and deciduous. Stamens 10, inserted on the throat of the corolla, 5 of them alternating with short filaments, the others opposite the corolla-lobes and sessile; anthers adnate to the filament, erect, the connective often shortly produced. Ovary in the males reduced to a subulate rudiment, in the females free, sessile, 1- or spuriously 5-celled, with numerous (rarely few) ovules attached in two rows to the 5 placentas; style very short or none, terminated by 5 simple or lobed stigmas. Berry large, fleshy, many-seeded. Seeds with a mucous firmly adhering arillus, the testa smooth, wrinkled or echinate. Albumen fleshy.—Trees or shrubs, abounding in milky-juice, with alternate, large, palmate or rarely digitate-foliolate leaves. Stipules none. Racemes or panicles often peduncled, axillary, without bracts.

1. **C. papaya**, L.; Brand. For. Fl. 244.—*Thimbaw.*—An evergreen glabrous tree (20—25+16—20+1—3), with a cylindrical naked stem forked-branched at the summit, and bearing there numerous crowded, large, long-petioled leaves; leaves on 1½-2½ ft.

long petioles, palmately 7-9-lobed, with the shortly acuminate lobes entire or again lobed, glabrous, entire, $1\frac{1}{2}$ to $2\frac{1}{2}$ ft. in diameter; flowers white, very shortly pedicelled, cymose, forming long-peduncled, glabrous, pendulous, axillary, bractless panicles; corolla of females with a tube about $\frac{2}{3}$ in. long, the lobes oblong-lanceolate, 4-5 lin. long; female flowers much larger and thick, sessile, without a tube, the petals oblong, about an inch long, saccate at the base; fruits oboval, obtuse, from $\frac{1}{4}$ to 1 ft. long, green, then yellowish, smooth, obsoletely 5-angular, the whole inner surface covered with seeds, the latter about a line long, black, tubercled, surrounded by a succulent, thin, pellucid arillus.

Hab.—Generally cultivated all over Burma and adjacent islands, sometimes springing up spontaneously.—Fl. Fr. nearly the whole year. SS.= ∞.

Remarks.—Wood spongy, fibrous, coarse and very perishable. Exudes a white resin. The milky juice of the unripe fruit is a powerful vermifuge. Water impregnated with the milky juice makes all sorts of meat washed in it tender.

DATISCACEÆ.

Flowers regular, dioecious, rarely hermaphrodite or polygamous. Males: calyx-tube very short or hemispherical; lobes 3-9, short, equal or unequal. Petals none or 8. Stamens 4-25, opposite the calyx-lobes; anthers 2-celled. Rudiment of ovary minute or none. Females and hermaphrodites: calyx-tube adnate to the ovary; lobes 3-8. Stamens as in the males or reduced to staminodes. Ovary 1-celled, open or closed at the summit; placentas parietal, with many anatropous ovules in 2 or more series; styles as many as placentas, simple or 2-parted, stigmatic inside or terminated by capitate stigmas. Capsule membranous or coriaceous, dehiscing between the styles, many-seeded. Seeds minute, the testa punctate or striate. Embryo cylindrical, imbedded in the axis of the scanty albumen; radicle elongate, next the hilum.—Large trees or herbs, with simple or compound leaves.

TETRAMELES, R. Br.

Flowers dioecious. Petals none. Males: calyx-tube very short; lobes 4, equal or unequal. Stamens 4, inserted round a depressed disk; filaments elongate; anthers didymous. Ovary-rudiment 4-angular or none. Females: calyx-tube almost 4-angular, with 4 short lobes. Staminodes none. Ovary open at the apex, the ovules inserted in 3-4 rows on the parietal placentas; styles 4, short, almost clavate. Capsule membranous, open at the summit and crowned by the 4 styles.—Large trees. Flowers in spikes simple in females and panicled in the males.

1. **T. nudiflora**, R. Br.; Bedd. Sylv. Madr. t. 212.—*Thit-pouk.*—A tree (120—150 + 80—100 + 10—15), leafless during H.S., the young shoots tawny pubescent or velvety, the trunk much buttressed at the base; bark grey, ¼ in. thick, smooth, beset with numerous bursted warts about an inch thick, the outer pergamaceous skin easily separating; cut dry, pale brown; leaves rotundate or broadly ovate, on 2½-4 in. long petioles, rounded or almost truncate at the base, acute or acuminate, sometimes obscurely 3-lobed, irregularly bluntish toothed, membranous, 3-5 in. long and nearly as broad, beneath puberulous or pubescent; the nerves very prominent; flowers very small, apetalous, greenish, dioecious, sessile or nearly so, in puberulous spikes crowded at the apex of the rather thick leafless branchlets; calyx glandular-viscose, in the females about a line long; capsules ovoid-globular, the size of a pepper-kernel, membranous, viscose, open at the 4-styled almost 4-angular mouth.

Hab.—More or less common in the tropical forests all over Burma from Pegu and Martaban down to Tenasserim and the Andamans; rare along choungs of the Prome district.—Fl. March-Apr.; Fr. May-June.—s. l.—SS.=Metam. SiS.

Remarks.—Wood brown, light, coarse-fibrous, rather loose-grained, valueless.

ARALIACEÆ.

Flowers hermaphrodite or polygamous, regular. Calyx-limb forming a slightly raised line or short cup round the summit, truncate or toothed, or quite inconspicuous. Petals 5 or more, rarely 4, valvate, shortly inflected at the tip and often cohering (very rarely blunt and imbricate). Stamens as many as petals or sometimes more; anthers versatile, the cells parallel and opening longitudinally. Ovary inferior, 2- or more- rarely by abortion 1-celled, with a single anatropous ovule in each cell suspended from the summit; styles as many as cells, either distinct with small terminal stigmas, or united in a cone, or more or less reduced to a slight protuberance with inconspicuous stigmas. Fruit more or less drupaceous and indehiscent, the epicarp succulent, rarely almost dry and thin. Seeds, solitary, pendulous, enclosed in pyrenes. Albumen homogeneous or ruminate. Embryo minute, near the apex, with a superior radicle.—Trees, often palm-like, shrubs, or climbers, with alternate, compound, or rarely simple leaves. Stipules none. Flowers small, in umbels or heads, often collected into panicles.

This family includes the ginseng-root (*Panax ginseng*, Mey.), from China. Some species yield aromatic gum-resins. The wood of the trees belonging here is very perishable and valueless. The species described are all that are known from Burma.

∗ *Petals more or less imbricate in bud. Gynoecium 2-5-merous.*

Styles free; leaves pinnate or decompound . . . . . *Aralia.*

∗ ∗ *Petals valvate in bud, or rarely firmly cohering.*

○ Stamens as many as petals.

\+ Albumen homogeneous.

× Ovary usually 2- (rarely 1-4) -celled. Flowers 5-merous.

Styles from the base free, erect, then recurved; leaves decompound, 1-foliolate, or rarely pinnate or digitate; pedicels jointed under the calyx . . . . . *Panax.*

Stigmas sessile and diverging; styles united in a column; leaves palmatifid or lobed; pedicels not jointed . . . *Brassaiopsis.*

× × Ovary 5- or more (rarely by abortion 3-4) -celled.

† Pedicels jointed below the calyx; leaves pinnate . . . . . *Polyscias.*

† † Pedicels not jointed.

Leaves digitate; flowers 5-6 (rarely-8)-merous . . . . *Heptapleurum.*

Leaves often palmatifid; flowers 8-12-merous . . . . *Trevesia.*

\+ \+ Albumen ruminate.

Pedicels not jointed; ovary 1-celled; leaves pinnate or simple . *Arthrophyllum.*

Pedicels not jointed; leaves pinnately compound; ovary 2-celled . *Heteropanax.*

Pedicels jointed; leaves digitate . . . . . *Macropanax.*

○ ○ Stamens numerous; petals firmly cohering; gynoecium up to 100-merous; leaves digitate . . *Tupidanthus.*

ARALIA, L.

Calyx-limb somewhat prominent, truncate, repand or very shortly 5-toothed. Petals 5, blunt or very shortly inflected, acuminate, more or less imbricate in bud. Stamens 5; anthers oblong or rarely ovate. Disk almost flat or sometimes conical, with a free border. Ovary 2-5-celled; styles free or shortly united, the stigmas terminal. Fruits laterally compressed or (in a dried state) 3-5-cornered, the pericarp fleshy; pyrenes 2-5, compressed, crustaceous or hard. Albumen homogeneous.—Perennials, shrubs, or small trees, often armed with bristles or thorns, the stipules somewhat prominent from the base of the petiole. Leaves alternate, pinnate or pinnately decompound. Flowers usually polygamously dioecious, in umbels, forming racemes or panicles. Pedicels jointed.

1. **A. armata,** Seem.—An evergreen small tree; leaves decompound, the petiole and rachises all glabrous and sparingly beset with hooked thorns; leaflets ovate-oblong or oblong, on very short hispid petiolules or almost sessile, finely acuminate, serrulate, membranous, 1½-2 in. long, minutely hispid and, especially along the nerves, sprinkled with stiff bristles; flowers minute, whitish, on stiff, about 2 lin. long, hispid pedicels, forming small peduncled umbels arranged into large, lax, shortly hispid, but partially glabrescent, sparingly thorny panicles at the end of the branchlets; styles free, recurved; fruits the size of a pepper-kernel, glabrous, 5-merous.

Hab.—Tenasserim.—Fl. Aug.

PANAX, L.

Calyx limb usually slightly prominent, truncate or shortly 5-toothed. Petals 5, valvate, often cohering with their tips. Stamens 5. Disk broad and not thick, the margins sometimes prominent. Ovary 2- rarely 3-celled; styles 2, rarely 3, erect and sometimes cohering, then distinct and recurved. Fruit flattened, with a more or less succulent pericarp; pyrenes hardened, sometimes 2-ribbed on the dorsal edge. Albumen homogeneous.—Trees or shrubs, with decompound or 1-foliolate, rarely pinnate or digitate leaves. Flowers in umbels, heads or racemes, forming usually compound racemes or panicles. Pedicels jointed.

Leaves decompound-tripinnate; leaflets bristly-serrate . . *P. fruticosus.*
Leaves 1-foliolate; leaflets acutely serrate . . . . . *P. cochleatum.*

1. **P. fruticosus,** L.—An evergreen shrub, all parts glabrous; leaves decompound-tripinnate, 1-1½ ft. long; leaflets variable in shape, usually more or less lanceolate, the lowermost ones usually broader, often variously laciniate, bristly-serrate, acuminate, 1-2 in. long, membranous, glabrous; flowers small, greenish white, in small umbellets forming large terminal glabrous panicles; calyx-limb 5-toothed; petals 5, linear, first spreading, then reflexed; berry 2- or 3-lobed, small, lead-coloured.

Hab.—Occasionally cultivated in the shade of villages in the southern parts of Burma.—Fl. Apr.

BRASSAIOPSIS, Dcne. & Planch.

Calyx-limb usually somewhat prominent, minutely 5-toothed. Petals 5, valvate. Stamens 5; filaments filiform. Disk broad, usually narrowed into the style-column. Ovary 2- and often also 1-celled; stigmas sessile and diverging. Fruits ovoid or oblong, terete, the endocarp pergamaceous, didymous or entire, the pericarp more or less succulent or chartaceous. Seeds hemispherical or terete. Albumen homogeneous.—Small trees of the habit of *Trevesia,* with palmatifid or lobed leaves. Flowers in umbels arising from the dense woolly bracted end of the peduncle, forming terminal panicles. Pedicels not jointed below the calyx.

1. **B. palmata,** Kz.—An evergreen tree (15—20 + 8—15 + 1½—2), palm-like and simple or slightly branched at the top, the shoots covered with a tawny or rusty-coloured scurfy tomentum; leaves crowded at the end of the stem or branches, large, about a foot each way, palmately 7-9-lobed (the lobes broad, shortly acuminate and somewhat narrowed towards the base), remotely toothed, membranous, while young along with the petiole densely rusty

scurfy-tomentose, turning quite glabrous; flowers on long jointed pedicels, arising in umbels from a dense head of rusty-tomentose bractlets and forming large axillary racemes at the end of the branches; fruits elliptical, terete, the size of a large pea, crowned by the minute calyx-teeth and the slender style-column, containing 1 or often 2 pergamaceous 1-seeded pyrenes.

Hab.—Frequent in the tropical forests of the Andamans; also Chittagong.—Fr. May-June.—s.—SS.=SiS.

HEPTAPLEURUM, Gaertn.

Calyx-limb hardly visible or the teeth minute. Petals 5 or 6, rarely more, valvate. Stamens as many as petals. Disk convex or conical, in the male flowers concave. Ovary with as many cells as petals; styles united in a short cone or column, with as many sessile scarcely prominent stigmas as there are cells. Fruit almost globular (in a dried state often angular) with a fleshy pericarp; pyrenes laterally compressed, crustaceous, chartaceous or hard. Seeds laterally compressed. Albumen homogeneous.—Trees or tall shrubs, often climbing, with digitate or digitately compound leaves. Flowers usually unisexual, in umbels or racemes, forming large panicles or rarely racemes. Pedicels not jointed.

Climber, glabrous; stigmas dot-like, immersed on the ovary . . . *H. venulosum.*
Erect trees; styles united in an elongate column; leaflets on thick rather short petiolules, not lobed . . . . . *H. glaucum.*
Leaflets on very long and slender petiolules, usually pinnatilobed, quite glabrous . . . . . *H. hypoleucum.*

1. **H. venulosum,** Seem.; Bedd. Sylv. Madr. 122; Brand. For. Fl. 249.—*Baloo-let-wa.*—An evergreen woody climber with cable-like stems, all parts glabrous; bark smooth, grey or almost white; leaves digitately 7-9-foliolate, long-petioled; leaflets on long petiolules, obovate-oblong to oblong, rounded at the base, more or less acuminate, entire, pergamaceous or almost coriaceous, nerved and laxly veined on both sides; flowers minute, greenish yellow, on slender pedicels, in small, long-peduncled umbellets, forming glabrous racemes collected into large terminal panicles; calyx hardly ½ lin. in diameter; petals ½ lin. long; fruits the size of a pepper-kernel, sharply angulate.

Hab.—Frequent in the mixed forests all over Burma from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. Apr.-May.—s+l.—SS.=SiS. All., etc.

2. **H. glaucum,** Bth. & H.f.—An evergreen tree (20—30+10—15+3—4), the younger parts covered with a floccose, scurfy, grey or somewhat tawny tomentum, soon glabrescent; leaves very

long petioled, digitately 7-foliolate, more or less tawny or greyish floccose-scurfy while very young; leaflets oblong to oblong-ovate, on ½ to 3 in. long petiolules, very variable in size (from 5-10 in. long), rounded or obtuse at the base, acuminate, simple, entire or remotely serrate, coriaceous, glaucous beneath; flowers small, on scurfy long pedicels, in long-peduncled umbels collected into tawny scurfy-tomentose racemes or panicles at the end of the branches and usually shorter than the petioles; styles united into a column at the summit, diverging into 5 stigmatic lobes; fruits globular, the size of a small pea, fugaceously scurfy-tomentose while young, in a dried state bluntish 5-cornered.

Hab.—Frequent in the drier hill forests of the Martaban hills, at 5,000 to 7,000 ft. elevation.—Fr. March.—s.—SS.=Metam.

3. **H. hypoleucum,** Kz.—An evergreen tree, about 30 to 40 ft. high, remaining stunted and much branched in higher regions, all parts glabrous; leaves on petioles 14 to 20 in. long, digitately 5-7-foliolate, scurfy tomentose while very young; leaflets on slender petiolules 3-4 in. long, oblong or elliptically oblong, obtuse or rotundate at the base, very variable in size (6-12 in. long), pinnatilobed (the 5-7 lobes much acuminate), rarely simple, entire or serrate-toothed, quite glabrous, chartaceous, glaucous or almost whitish beneath; flowers tomentose, very shortly pedicelled, in long-peduncled densely scurfy head-like umbels forming racemes arranged into panicles.

Hab.—Not unfrequent in the drier hill forests of Martaban, at 6,000 ft. elevation; also Ava, Khakyen hills.—SS.=Metam.

TREVESIA, Vis.

Calyx-limb entire, waved or repand-toothed. Petals 8-12, valvate. Stamens as many as petals. Disk convex, conical or tapering into the style-column. Ovary 8-12-celled; styles united in a short cone or elongated column, the stigmas terminal, sessile and annular. Fruit ovoid or almost globular (in a dried state often furrowed) with a fleshy epicarp; pyrenes laterally compressed, pergamaceous or crustaceous. Seeds laterally compressed. Albumen homogeneous.—Small trees or shrubs, often armed, with palmately lobed or digitate leaves. Flowers polygamous, rather large, umbellate, in panicles. Pedicels not jointed.

1. **T. palmata,** Vis.—*Baw.*—An evergreen treelet (10—15+6—10+½—1), palm-like, armed with short conical very sharp thorns, the young shoots rusty mealy-tomentose; leaves large, about 2 ft. in diameter, on a very long somewhat spiny petiole, usually deeply palmately 7-9-lobed, with the acute or shortly acuminate lobes

more or less narrowed at base (in younger plants often so much as to leave only the ribs as a connecting link with the lobe-blades), remotely serrate-toothed, thick membranous, while very young sprinkled with a stellate tawny down, soon turning quite glabrous, the ribs sharply prominent on the upper side; flowers rather large, on slender pedicels, in long-peduncled umbels forming terminal racemes or panicles more or less sprinkled with rusty-stellate hairs; calyx and petals outside rusty stellate-puberulous; fruits the size of a bullet, almost glabrous, terete, crowned by the short, thick style-column.

Hab.—Common in the tropical forests of Ava, Chittagong, and Martaban down to Tenasserim, rather rare in the Pegu Yomah, up to 4,000 ft. elevation. —Fl. March-April; Fr. June-July—s.—SS. = SiS. *Metam.*

ARTHROPHYLLUM, Bl.

Calyx-teeth 5, short. Petals 5, valvate. Stamens 5. Disk expanded, with a free waved margin. Ovary 1-celled, with a solitary ovule, the very short style confluent with the raised centre of the disk. Fruit ovoid or almost globose, 1-celled and 1-seeded. Albumen ruminate.—Trees, with alternate or occasionally opposite pinnately compound or simple leaves. Umbellets forming larger umbels. Pedicels not jointed.

1. **A. Javanicum**, Bl.—An evergreen palm-like tree (35—40 + 30—35 + 2—3½), all parts glabrous, the trunk simple or slightly branched at the top; leaves unpaired pinnate, or the floral smaller ones usually simple or variously reduced, long-peduncled, crowded at the apex of the stem, glabrous; leaflets in 7-8 pairs with an odd one, obliquely ovate, acute at the rounded base, on long slender petiolules, shortly and rather abruptly acuminate, 3-4 in. long, pergamaceous, glabrous, pale-coloured beneath; flowers rather small, white, on slender fugaceously woolly pedicels up to 2 lin. long, forming small fugaceously rusty or tawny woolly but soon glabrescent umbellets collected into larger ones usually furnished with simple or irregularly 3-foliolate floral leaves; petals about a line long; calyx of fertile flowers ovoid, more than a line long, minutely toothed; berries ovoid-oblong, on rather stiff pedicels ½-¾ in. long, about 3-4 lin. long, smooth, crowned by the opercle-like disk.

Hab.—Frequent in the tropical forests of the western coast of South Andaman.—s.—SS.=SiS., etc.

HETEROPANAX, Seem.

Calyx-limb minutely toothed. Petals 5, valvate. Stamens 5; filaments filiform; anthers ovate. Disk nearly flat. Ovary 2-

celled; styles 2, filiform, free from the base, the stigmas nearly terminal. Fruits almost didymous, laterally compressed, coriaceous; pyrenes crustaceous or hard. Seeds compressed. Albumen ruminate.—Trees, with pinnately decompound leaves. Flowers umbelled, in racemes, forming terminal panicles. Pedicels not jointed.

1. **H. fragrans,** Seem.; Brand. For. Fl. 249.—*Ta-chan-sa.*—A tree (50—60+25—30+4—5), remaining stunted in poor soils, leafless during H.S., all parts glabrous; bark about an inch thick, smooth, grey; cut sappy, pale-coloured; leaves large, pinnately decompound, glabrous, the pinnæ at their forks usually supported by a pair of simple opposite leaflets; leaflets variable in size, usually 4-5 in. long, ovate, on rather short, thick petiolules, acute or obtuse at the base, acuminate, entire, almost coriaceous; flowers small, whitish tomentose, umbelled, the umbels collected in racemes, forming terminal, densely tawny-tomentose panicles shorter than the leaves; fruits compressed, broader than long, on rather long peduncles, more or less puberulous, turning glabrous and somewhat glaucous.

Hab.—Frequent in the leaf-shedding forests all over Burma from Chittagong and Ava down to Tenasserim, ascending into the upper dry forests to 3,000 ft. elevation —Fl. Jan.-Feb.; Fr. May-June.—l.—SS.=petrophilous and All. Dil.

Remarks.—Wood light brown or grey, rather heavy, fibrous, but close-grained, very perishable.

MACROPANAX, Miq.

Calyx-teeth 5, distinct. Petals 5, valvate. Stamens 5; filaments filiform; anthers ovate or oblong. Disk thick, cushion-like, or almost conical, in the centre produced into the style-column. Ovary 2-celled; styles united in a column, the stigmas terminal. Fruits nearly globular or ovoid, fleshy; pyrenes chartaceous or crustaceous. Seeds rather thick, compressed on the back, flat or concave in front. Albumen ruminate or much wrinkled.—Trees or shrubs, thorny or unarmed, with digitate leaves. Flowers polygamous, umbelled, or rarely in heads, forming large panicles. Pedicels jointed at apex.

1. **M. oreophilum,** Miq.—An evergreen tree (30—40+20—30+2—3), all parts glabrous; leaves digitately 5-9-foliolate, glabrous, on a long petiole; leaflets lanceolate to oblong-lanceolate, 5–6 in. long, on rather long petiolules, obtuse or acute at the base, acuminate, serrate-toothed; flowers small, slenderly pedicelled, forming rusty-puberulous racemes collected into large panicles.

Hab.—Frequent in the damp and drier hill forests of the Martaban hills east of Tounghoo, at 5,000 to 6,000 ft. elevation; also Ava, Kakhyen hills.—s.—SS. =Metam.

TUPIDANTHUS, Hf. & Th.

Calyx-tube clavate-hemispherical, the limb truncate, closely concrete with the calyptra-like united petals. Stamens very numerous; filaments thick-subulate; anthers oblong. Disk convex. Ovary many-celled, the cells radiate, very narrow; styles none. Stigmas up to 90 and more, sessile, arranged in sinuose lines round the centre of the obscurely lobed disk. Berry coriaceous, many-celled.—Scandent trees, with almost cable-like stem and digitate leaves. Flowers rather large, umbelled, collected into a raceme or panicle. Pedicels not jointed.

1. **T. calyptratus,** Hf. and Th.—An evergreen scandent tree, 20 to 30 ft. high, all parts glabrous; leaves large, long-petioled, digitately 5-8-foliolate; leaflets oblong to obovate-lanceolate, long-petioluled, acuminate, entire, coriaceous, glabrous; flowers rather large, greenish, on thick half an inch long pedicels, umbelled and forming a short, robust, lateral, glabrous raceme; calyx $\frac{1}{2}$-$\frac{3}{4}$ in. across, very thick.

Hab.—Tropical forests of the eastern slopes of the Arracan Yomah.

CORNACEÆ.

Flowers unisexual or hermaphrodite, regular. Calyx-tube adnate to the ovary, the limb forming a raised border, persistent, truncate, or with as many teeth as petals. Petals 4 or 5, rarely more, (imbricate or) valvate, inserted round an epigynous disk or on the calyx-border, rarely wanting; stamens as many, or rarely 2-4 times as many, as petals, and inserted with them; filaments filiform or complanate; anthers with parallel cells opening longitudinally. Disk epigynous or central, variously shaped. Ovary inferior, 1-4-celled, with 1 or rarely 2 anatropous pendulous ovules in each cell; style simple, with a terminal, entire, or rarely lobed, or 2-3-cleft stigma. Fruit an indehiscent drupe, with an 1-4-celled stone or rarely 2 bony or crustaceous pyrenes. Seeds pendulous. Albumen fleshy. Embryo straight, nearly as long as the albumen, the radicle superior and shorter than the flat usually leafy cotyledons.—Trees or shrubs, rarely herbs, with opposite or rarely alternate, simple, or slightly-lobed leaves. Stipules none. Flowers usually small, in axillary or terminal heads, cymes, or corymbose panicles.

An order of little importance. The bark of a few species of *Cornus* ranks amongst the best tonics in North America, and the timber of a few species of *Alangium* and *Marlea* is good. The Burmese species are all woody plants.

* *Petals narrow-linear. Anthers basifix. Style elongate.*
Albumen ruminate . . . . . *Alangium.*
Albumen homogeneous . . . . . *Marlea.*
** *Petals short. Anthers dorsifix. Style short. Petals* 4 *Cornus.*

ALANGIUM, Lamk.

Flowers hermaphrodite. Calyx-tube turbinate, often sulcate, the limb truncate or 5- to 10-toothed. Petals 5-10, narrow-linear, valvate; stamens as many, or more usually 2-4 times as many, as petals; anthers elongate-linear, basifix. Disk cushion-like, depressed on the centre, lobed or crenulate. Ovary 1-celled, with a single pendulous ovule; style elongate-clavate or filiform; stigma entire, lobed, or cleft. Drupe crowned by the calyx-limb. Albumen ruminate.—Shrubs or small trees, sometimes spinescent, with alternate leaves 3-nerved at base. Flowers in axillary clusters or cymes; pedicels jointed.

A tree, often armed; petioles 6-8 lin. long; petals 10-6; filaments densely pilose at the base . . . . . *A decapetalum.*
A large climber, unarmed; petioles shorter; petals 6; filaments sparingly pilose at the base . . . . . *A. Sundanum.*

1. **A. decapetalum,** Lamk. (*A. Lamarckii,* Bedd. Sylv. Madr. t. 215; Brand. For. Fl. 250.)—A small tree or shrub, unarmed, or in drier climates the branches spinescent, all softer parts more or less pubescent or glabrescent; leaves variable, from linear-oblong to elliptical and elliptically-obovate, on a shorter or longer, slender, pubescent or glabrous petiole, bluntish or shortly bluntish acuminate or apiculate, rounded to acute at the base, 3-5 in. long, entire, chartaceous, above glabrous or almost so, beneath shortly pubescent, puberulous or altogether glabrous; flowers cream-coloured or white, rather conspicuous, usually by 3 or fewer clustered in the axils of the leaves or above the scars of the fallen ones; pedicels short, few-bracted, tomentose; calyx densely tawny tomentose or velvety, more or less distinctly 5- to 10-toothed; petals 5-10, narrow-linear, about an inch long, blunt, tawny-velvety outside; stamens 3-4 times as many as petals; filaments very short, densely hirsute; drupes oblong, $\frac{1}{3}$-$\frac{1}{2}$ in. long, smooth, crowned by the calyx-limb, containing an oblong, 1-seeded, bony stone.

Hab.—Burma (according Rev. Mason).—Fl. Apr.-May.—l.

Remarks.—Wood strong, very close and even-grained, dark brown, easy to work.

2. **A. Sundanum,** Miq.—A large evergreen climbing shrub, the leaf-buds slightly pubescent; leaves elliptical to elliptically oblong, on a slender glabrous petiole 2-4 lin. long, apiculate, 3-5 in. long, chartaceous, glabrous and rather glossy; flowers cream-

coloured, rather large, very shortly pedicelled, in small, grey-tomentose cymes at the end of the branches or from the axils of the leaves; calyx cupular, shorter than deep, about a line long, densely greyish or tawny-greyish tomentose; petals 6, more than ½ in. long, linear, pubescent; style glabrous; filaments sparingly pilose at the base only.

Hab.—Tropical forests of the Andamans.—Fl. Apr.-May.—s : l.—SS.= SiS., etc.

MARLEA, Roxb.

Flowers hermaphrodite; calyx-tube bell-shaped or almost cylindrical, the limb cupular, minutely 4-8-toothed. Petals 4-8, free, or at the base cohering into a tube, linear. Stamens as many as petals; filaments free or their base adhering to the petals; anthers narrow-linear, adnate, dehiscing laterally. Disk cupular or cushion-like. Ovary 1-3-celled, or 1-celled at the top and 3-celled below, the ovules solitary and pendulous; style slender, with an entire or lobed stigma. Drupe small, containing a small 1-2-celled and -seeded putamen. Albumen fleshy.—Trees or shrubs, with alternate, simple, or lobed leaves. Flowers in axillary, simple, or dichotomous cymes; pedicels jointed.

Petals about ½ an in. long or shorter; connective glabrous; leaves glabrous . . . . . *M. begoniæfolia.*
Petals nearly an inch long; connective pilose and bearded; leaves puberulous beneath . . . . . *M. tomentosa.*

1. **M. begoniæfolia,** Roxb.; Brand. For. Fl. 251.—An evergreen tree (60-70 + 30—40 + 4—5), the young shoots tawny-pubescent; leaves from broadly and obliquely ovate-oblong to ovate, on a 1-1½ in. long, soon glabrescent petiole, acuminate, simple, or angular-lobed, or often produced into 1-4 short acuminate lobes, membranous, 4-6 in. long, 3-5-nerved at the base, glabrous, or with a tuft of hairs in the nerve-axils beneath, the principal nerves often puberulous; flowers rather small, on short and thick minutely bracted jointed pedicels, forming a glabrous or puberulous, peduncled dichotomous cyme in the axils of the leaves and shorter than them; calyx glabrous or pubescent, short; petals 6-8, narrow-linear, glabrous outside, about ½ in. long or somewhat shorter; filaments short and broad, tawny hirsute; anthers and connective quite glabrous; style glabrous or appressed hirsute with a coherent 4-lobed stigma; disk glabrous; drupes ovoid, the size of a small cherry, crowned by the minute calyx-limb, containing a 2-celled hard nut.

Hab.—Rare in the tropical forests of Martaban; Ava, Kakhyen hills.—Fl. March-May.—s : l.—SS.=Metam.

2. **M. tomentosa,** Endl.—A tree (90—100 + 40—50 + 6—9), probably evergreen, all softer parts more or less puberulous; bark ⅓ in. thick, dark-grey, covered with small pustules; cut greenish pale-brown; leaves more or less oblique, broadly ovate to ovate-oblong, on a pubescent soon glabrescent petiole 1-1½ in. long, shortly acuminate, simple or sometimes 4-5-lobed, 5-8 in. long, membranous, 5-6-nerved at the base, above along the nerves and beneath all over shortly puberulous; flowers conspicuous, white, turning yellowish, on ½ in. long, jointed, minutely puberulous, minutely 1-bracted pedicels, forming a dichotomous, minutely puberulous, peduncled cyme in the axils of the leaves longer than the petioles; calyx minutely velvety, with a spreading minutely 8-toothed limb; petals usually 8, nearly an inch long, minutely pubescent; stamens as many as petals; filaments short, compressed, ovate-oblong, very villous; anthers all along the connective villous and bearded towards the apex; disk minutely puberulous; style nearly an inch long, glabrous, capitately 4-lobed.

Hab.—Frequent in the tropical forests of Martaban.—Fl. March, Apr.—s: l.—SS.=Metam.

Remarks.—Wood pale brown, close-grained, with a silvery lustre, rather closely fibrous.

CORNUS, L.

Flowers hermaphrodite. Calyx-tube turbinate, urceolate or bell-shaped. Petals 4, oblong or ovate, valvate. Stamens 4; filaments subulate or filiform; anthers oblong. Disk cushion-like or obsolete. Ovary 2- very rarely 3-celled, the cells 1-ovuled; style filiform or columnar, with a capitate or truncate stigma. Drupe fleshy or sappy, containing a bony 2-celled putamen. Seeds compressed, the testa membranous. Albumen fleshy.—Trees or shrubs, rarely undershrubs, with opposite or very rarely alternate simple leaves. Flowers small, in dichotomously branched cymes or in nude or involucrate heads.

1. **C. oblonga,** Wall.—An evergreen (?) tree (20—30 + (?) + 1½—3), all parts glabrous; leaves lanceolate to oblong-lanceolate, tapering into a thick glabrous petiole ⅓-½ in. long or somewhat longer, acuminate, entire, 3-5 in. long, almost coriaceous, glabrous, beneath glaucescent and the principal nerves sharply prominent, somewhat rough from inconspicuous thin appressed hairs, hollow-glandular along the nerves and in the nerve-axils; flowers small, white, on slender rather short pedicels, forming a terminal, shortly peduncled, slightly minutely pubescent or almost glabrous dense cyme at the end of the branchlets; calyx small, 4-toothed, minutely

silky puberulous; petals linear-oblong, about 2 lin. long, usually silvery appressed puberulous or glabrous outside; anthers purple; drupe ovate-oblong, crowned by the calyx-limb, smooth, the size of a pepper-kernel, containing a 2- very rarely a 3-celled putamen.

Hab.—Frequent in the drier hill forests of the Martaban hills east of Tounghoo, at 4,000 to 7,000 ft. elevation.—Fl. Fr. March.—l.—SS.=Metam.

ADDITIONS AND CORRECTIONS.

P. 8, below line 4 from above, *insert:*

Plumbagineæ.—Calyx tubular; stamens 5; ovary 1-celled, with a single ovule suspended from a free filiform placenta; styles or style-branches 5; seeds rarely albuminous.—Herbs or rarely shrubs, with radical or alternate leaves.

P. 8, after line 4 from beneath, *insert:*

Gentianeæ.—Anthers free; ovary 1-celled with 2 or rarely more parietal placentas, rarely 2-celled; ovules numerous; style single; fruit a capsule, rarely indehiscent or berry-like; seeds albuminous.—Herbs, rarely shrubs or trees, sometimes twining; leaves opposite or rarely alternate.

P. 66, line 13 from below, *read* "*C. Roxburghii*" *for* "*C. religiosa.*"

P. 73, line 25 from below, *read* **FLACOURTIA** *for* **FLOCOURTIA.**

P. 87, line 9 from below, *read* "half the size" *for* "doubled, smaller."

P. 88, line 7 from above, *read* "deliciously" *for* "delicious."

P. 96, line 19 from below, *read* "basal" *for* "bisal."

P. 121, No. 2. **H. scaphula,** Roxb., is an **Anisoptera,** and should be inserted after **Anisoptera glabra** on page 112.

P. 138, after 9. **Sterculia rubiginosa,** Vt., *insert:*

9*b*. **St. Roxburghii,** Wall.—An evergreen, middling-sized tree, all parts glabrous; leaves oblong to oval and oblong-lanceolate, rounded at the base, on a slender petiole ½-1 in. long and thickened at both ends, cuspidate, 3-5 in. long, chartaceous, entire, glabrous; flowers small, scarlet, on capillary slightly stellate-hairy pedicels, forming slender axillary racemes up to 2½ in. long; calyx bell-shaped-rotate, glabrous, about ⅓-½ in. across, the lobes oblong-lanceolate, about 2-3 lin. long, acute; follicles oblong-lanceolate, somewhat curved, inflexed-acuminate, 2-3 in. long, crimson, roughish velvety outside, and quite glabrous and smooth inside, containing 4-8 ovoid black seeds.

HAB.—Chittagong.—Fl. Feb.-March; Fr. R.S.—s.

P. 139, line 17 from below, *insert* + after 120.

P. 194, line 3 from below, *read* **ATALANTIA** *for* **ATLANTIA.**

P. 233, line 23 from above, read *O. acuminata* for *O. Zeylanica;* and line 4 from below, *read* **O. acuminata,** Wall., *for* **O. Zeylanica,** L., and *omit* the citation of "Bedd. Sylv. Madr."

P. 257, after **Hippocratea macrantha**, Korth., *insert:*

4. **H. Lobbii**, Laws.—A climbing (?) shrub; leaves broadly elliptical, almost acuminate, entirely glabrous, 3-4 in. long by ¾-2 broad; cymes 2-3 times divided, shorter than the leaves; calyx-lobes elliptically oblong, entire, pubescent; petals elliptically ovate, slightly cohering at the base, entirely covered on the inside with dense ash-grey hairs, 2 lin. long; anthers almost sessile.—(After Lawson.)

HAB.—Upper Tenasserim.

P. 265, before **ZIZYPHUS**, *insert:*

2. **Berchemia polyphylla**, Wall.—An erect (?) shrub, the young branches puberulous; leaves ovate, blunt, on a puberulous petiole ¼ in. long, 1-1½ in. long; flowers on 1½-4 lin. long straight pedicels, forming axillary racemes; calyx 5-cleft, the lobes triangular, acute; petals 5, almost orbicular; stamens 5; fruit ⅓ in. long. Closely allied to *B. flavescens*.—(After Lawson.)

HAB.—Ava.

P. 267, after 4. **Zizyphus glabra**, Roxb., *insert:*

5. **Z. funiculosa**, Ham.—A large, evergreen, scandent shrub, armed with small recurved stipulary prickles, the young shoots puberulous; leaves lanceolate to ovate-lanceolate, rounded at the base, on a slender glabrous petiole up to ⅓ in. long, almost caudately but bluntish acuminate, finely serrulate, chartaceous, glabrous, 2-3½ in. long, strongly 3-nerved, finely transversely veined and almost silky-glossy; flowers small, on puberulous pedicels a lin. long, clustered and forming 2-forked small short-peduncled tawny-pubescent cymelets arranged into elongate axillary panicles much longer than the leaves; calyx rusty-pubescent, about a line across, the lobes 3-angular, about ½ lin. long; petals small, orbicular, clawed.

HAB.—Ava hills.

P. 288, line 15 from above, *read* "tabular" *for* "tubular."

P. 328, after 6. **Connarus grandis**, Jack, *insert:*

7. **C. stictophyllus**, Kz.—A shrub or small tree, the young shoots rusty puberulous, the branchlets white and copiously corky-lenticellate; leaves pinnate, on a slender petiole while young (along with the rachis) fugaceously brown puberulous; leaflets in 2 pairs with a longer petioled odd one, elliptically oval to oval-oblong, on a slender petiole about a line long, rounded at the base, 1½-2½ in. long, glabrous, pergammentaceous, apiculate, impressed-net-veined beneath, while young strongly bullate-dotted on the areoles; flowers rather small, on short tawny-tomentose pedicels, forming brachiate tawny-pubescent corymb-like cymes on rather slender peduncles of 1-2 in. length arising from the axils of the upper leaves or collected into a larger terminal corymb; calyx rusty or brown pubescent, the sepals linear-lanceolate, somewhat longer than a line, almost navicular-keeled; petals linear, bluntish, 3 lin. long, rusty or brown tomentose; stamens 10, the glabrous filaments united at base into a tube; ovary rusty-villous.

HAB.—Adjoining Siamese provinces.—Fl. May.

P. 342, in the key of **DALBERGIA**, *omit* lines 15 and 16, and correct thus:

× Pedicels slender, as long as the calyx; bracts and bractlets long, persistent, and rather conspicuous.
Calyx-teeth as long as the tube; inflorescence glabrous . . . *D. stipulacea.*
× × Flowers almost sessile; bractlets minute and deciduous; calyx-teeth minute.

Branchlets smooth; inflorescence densely pubescent; calyx a line long; corolla 2-3 lines long . . . . . *D. volubilis.*
Branchlets verrucose; panicles slender, almost glabrous; calyx ½ lin. long; corolla 1½ lin. long . . . . . *D. Thomsoni.*

P. 347, *cut out* 13. **Dalbergia rubiginosa,** Bth., and replace it by:

13. **D. Thomsoni,** Bth.—A large scandent shrub, probably evergreen, all parts nearly glabrous, the branchlets verrucose; leaves unequally pinnate, shortly petioled, the petiole and rachis slightly pubescent; leaflets in 5-4 pairs with an odd one, shortly and slenderly petioluled, obovate, acute or nearly cuneate at the base, rounded or almost retuse, ⅔-1 in. long, rarely somewhat larger, coriaceous, glabrous; flowers small, almost sessile, one-sided, forming forked and almost scorpioid slender cymes arranged into axillary or more usually terminal, slightly pubescent, glabrescent panicles, the bracts minute; calyx ½ lin. long, almost glabrous, the teeth minute; corolla about a line long or somewhat longer; stamens united into 2 separate sheaths; pods linear-oblong, 2-2½ in. long by ¾ broad, flat, greenish and not turning brown, narrowed from the middle into a very short stalk, veined on the centre.

Hab.—Rare in the tropical forests of the Kambala-toung, Pegu Yomah.

P. 381, line 19 from above, transpose the word "flexuose" to the line below, and insert it after "subulate."

P. 429, line 22 from below, *add* "Mart." after **PITHECOLOBIUM.**

P. 501, line 19 from below, *read* "yellow" *for* "welloy."

P. 506, line 13 from above, *read* **A. hispida** *for* **A. hispiad.**

P. 508, line 20 from above, *read* **A. cyanocarpum** *for* **cyanocarpa.**

ACC No. [redacted] 8268
ಗ್ರಂಥಾಲಯ
ಲಾಲ್‌ಭಾಗ್, ಬೆಂಗಳೂರು

ಡಾ॥ ಎಂ.ಹೆಚ್.ಮರೀಗೌಡ ರಾಷ್ಟ್ರೀಯ ಗ್ರಂಥಾಲಯ

ಲಾಲ್‌ಬಾಗ್, ಬೆಂಗಳೂರು – 560 004

ಪ.ಸಂಖ್ಯೆ:... [redacted] ವ.ಸಂಖ್ಯೆ:.....

ಗ್ರಂಥ ಹಿಂದಿರುಗಿಸುವ ದಿನಾಂಕ ಚೀಟಿ

ಈ ಕೆಳಗೆ ಕಾಣಿಸಿರುವ ದಿನದಂದು ಅಥವಾ ಅದಕ್ಕೂ ಮುಂಚೆ ಈ ಪುಸ್ತಕವನ್ನು ಹಿಂದಿರುಗಿಸಬೇಕು. ಅಥವಾ ಮುಂಚಿತವಾಗಿ ನವೀಕರಿಸಬೇಕು. ಇಲ್ಲದಿದ್ದರೆ ಒಂದು ದಿನಕ್ಕೆ ರೂ.1.00 ದಂಡ ಕೊಡಬೇಕಾಗುತ್ತದೆ.

ದಿನಾಂಕ.....ಸಹಿ	ದಿನಾಂಕ.....ಸಹಿ	ದಿನಾಂಕ.....ಸಹಿ

ವ. ಸಂಖ್ಯೆ _____

ತೋಟಗಾರಿಕೆ ಇಲಾಖೆಯ
ಗ್ರಂಥಾಲಯ

ಲಾಲ್‌ಬಾಗ್, ಬೆಂಗಳೂರು-560 004